

PACIFIC SEABIRDS



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PACIFIC SEABIRD GROUP

Dedicated to the Study and Conservation of Pacific Seabirds and Their Environment

The Pacific Seabird Group (PSG) was formed in 1972 due to the need for better communication among Pacific seabird researchers. PSG provides a forum for the research activities of its members, promotes the conservation of seabirds, and informs members and the public of issues relating to Pacific Ocean seabirds and their environment. PSG members include research scientists, conservation professionals, and members of the public from all parts of the Pacific Ocean. The group also welcomes seabird professionals and enthusiasts in other parts of the world. PSG holds annual meetings at which scientific papers and symposia are presented; abstracts for meetings are published on our web site. The group is active in promoting conservation of seabirds, include seabird/fisheries interactions, monitoring of seabird populations, seabird restoration following oil spills, establishment of seabird sanctuaries, and endangered species. Policy statements are issued on conservation issues of critical importance. PSG's journals are *Pacific Seabirds* (formerly the *PSG Bulletin*) and *Marine Ornithology*. Other publications include symposium volumes and technical reports; these are listed near the back of this issue. PSG is a member of the International Union for Conservation of Nature (IUCN), the Ornithological Council, and the American Bird Conservancy. Annual dues for membership are \$30 (individual and family); \$24 (student, undergraduate and graduate); and \$900 (Life Membership, payable in five \$180 installments). Dues are payable to the Treasurer; see the PSG web site, or the Membership Order Form next to inside back cover.

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Pacific Seabirds

Pacific Seabirds publishes short peer-reviewed articles, reports of ongoing work, conservation news, and other items of importance to seabird science and conservation in the Pacific Ocean. The journal is published twice a year in spring and fall. Materials should be submitted to the Editor, except that conservation-related material should be submitted to the Associate Editor for Conservation. Information for contributors to *Pacific Seabirds* is published in each Fall issue. Back issues of the *PSG Bulletin* (volumes 1–20) and *Pacific Seabirds* (volumes 21 on) are posted on the group's web site, or they may be ordered from the treasurer (see Membership/Order Form on last page for details). Submission deadlines are April 1 for the spring issue and October 1 for the fall issue; manuscripts may be submitted at any time.

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Marine Ornithology

Marine Ornithology presents peer-reviewed contributions concerning international seabird science and conservation. The journal is published two times a year. It is available on its web site or by subscription. The journal is supported by a partnership of global seabird societies, including the Pacific Seabird Group (PSG), African Seabird Group, Australasian Seabird Group, the Seabird Group (U.K.), Dutch Seabird Group, and Japan Seabird Group. For further information see www.marineornithology.org

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LIFETIME AND SPECIAL ACHIEVEMENT AWARDS

The Pacific Seabird Group occasionally honors outstanding contributors to seabird science and conservation with Lifetime Achievement or Special Achievement Awards. At the 36th Annual Meeting in Hakodate, Hokkaido, Japan, PSG presented the Lifetime Achievement Award to Professor Haruo Ogi and the Special Achievement Award to Dr. Yutaka Watanuki. A report on the Hakodate meeting was published in *Pacific Seabirds* 36(1):12.

LIFETIME ACHIEVEMENT AWARD: HARUO OGI

Lora L. Leschner and Robert H. Day



Haruo Ogi was born in Tokyo in 1940. He began his studies of marine ecology with his Bachelor's degree in Fisheries in 1969 and his Master's thesis on the feeding ecology of Sockeye Salmon (*Oncorhynchus nerka*) in 1971. He started his studies of seabirds in the 1970s at Hokkaido University, where he studied food and feeding habits of the Common Murre and Thick-billed Murre (*Uria aalge* and *U. lomvia*) in the Okhotsk Sea, northern North Pacific Ocean, and Bering Sea. In 1977, he began working as an Assistant at Hokkaido University, where he recently had received his Ph.D. He was promoted to Instructor in 1980, Associate Professor in 1984, and Professor in 1995. In 2000, he was named

a Professor in the Graduate School of Fisheries Sciences, and he was named an Emeritus Professor there upon his retirement in 2002.

EARLY CONNECTIONS AND CONTRIBUTIONS

While George Divoky, one of the Pacific Seabird Group's (PSG's) founding members, was compiling names of those interested in the new PSG in 1973, he corresponded regularly with a graduate student named Haruo Ogi. Dr. Ogi offered encouragement for PSG's desire to provide a unified voice for seabird researchers and conservation. Dr. Ogi became one of the first members of PSG, and his name is listed in Volume 1, Number 1 of the *PSG Bulletin*.

While Ogi-san was still a graduate student, he attended the First Annual Meeting of the PSG in Issaquah, Washington, in December 1974. Some of the money to help him attend came from the National Headquarters of the National Audubon Society, and it was the first grant money (\$500) that PSG ever received. Dr. Ogi was studying seabird ecology on Japanese fishing boats, and he explained that the Japanese government and fishing industry were very concerned about his presentation to the US scientists. The meeting attendees soon learned why: Ogi-san presented slide after slide with columns of data on food habits of

Common and Thick-billed Murres. One research scientist viewing the slides exclaimed later, "Those are thousands of dead murres! Murres that died as a result of fisheries bycatch. No wonder the Japanese fisheries organizations were concerned!" Ogi-san documented not only the food habits of seabirds, but also the tremendous loss of birds to fisheries bycatch.

Ogi-san was an important presence at early PSG meetings. His attendance at those meetings meant much to the organization, not only because of the distance he had to travel to attend, but also because he was the main indication that PSG truly was the international organization it aspired to be. The papers that Ogi-san presented on seabird bycatch combined the two primary facets



of what the PSG hoped to encourage: solid seabird research, combined with the identification of important conservation issues requiring the attention of agencies and governments. As a result of his attendance and the scientific papers he presented at the early PSG meetings, Ogi-san inspired the group's early conservation efforts to reduce the bycatch of seabirds in the North Pacific Ocean and Bering Sea. In 1976–1977, Ogi-san also became a member of PSG's Executive Council as a Regional Representative for the Pacific Rim.

Ogi-san made a number of lifelong friends at that first PSG meeting. George Divoky assisted in organizing the meeting, and he was speechless, a regrettably uncommon condition for him, when Ogi-san asked George to follow him to a secluded corner of a meeting room and presented him with a tie clasp decorated with a Japanese duck. The formality and solemnity of the gift presentation, Ogi-san's clear pleasure in providing the gift, and Divoky's lack of anything with which he could reciprocate never made George feel more like a "Yankee barbarian."

Lora Leschner, then a University of Washington graduate student studying Rhinoceros Auklets (*Cerorhinca monocerata*), was Ogi-san's host and guide at the first meeting and subsequently has been a friend for nearly 35 years. Ogi-san had to commute to and from the Issaquah meeting with a carload of other graduate students, who stayed at Lora's house to save lodging fees. During those drives, he shared stories of his adventures working at sea and of life in Japan. Over the years, Ogi-san shared his Japanese publications with Lora and other PSG friends.

Ogi-san was one of the organizers of the first Japanese Seabird Conference in Haboro, Japan, in June 1996. The theme of that meeting was the conservation of seabirds. He invited North American researchers that he met through PSG to tell Japanese officials and conservationists about conservation strategies in the United States and Canada that could be

applied to Japan and, especially, Teuri Island. Teuri was home to one of the largest Rhinoceros Auklet colonies in the world, and also home to a Japanese fishing village that was very fond of cats. The visiting biologists discussed fishing regulations to protect seabirds, decoys to attract murrelets to nesting islands, seabird research, and, of course, the impact of predators such as cats on seabird colonies.

A SCIENTIST OF WIDE-RANGING INTERESTS

Over the course of his career, Professor Ogi has made significant contributions to our understanding of the at-sea ecology and conservation of seabirds and the marine ecology of the North Pacific and the Bering Sea. A quick glance at the partial bibliography of publications of Professor Ogi (see below) reflects his wide-ranging interests in marine ecology and, especially, in the ecology and conservation of seabirds.

Dr. Ogi has specialized in marine ecology and anthropogenic threats to marine ecosystems. He has published or has been a coauthor on numerous papers on the feeding ecology of seabirds; the at-sea distribution and abundance of seabirds; the at-sea biology and molt of shearwaters and albatrosses; fisheries bycatch of seabirds; plastic pollution of seabirds and the oceans; the breeding biology of seabirds; the parasitology of seabirds; avian influenza; the contamination of seabirds by hydrocarbons, plastic pollutants, and heavy metals; and seabird conservation.

Professor Ogi's research interests have changed over the years but always have concentrated primarily on seabirds. In the 1970s, he published papers on the feeding ecology of Common and Thick-billed murrelets in the eastern Bering Sea and the Okhotsk Sea, based primarily on murrelets killed as bycatch in drift-gillnet salmon fisheries. In the 1980s, he published or coauthored papers on the feeding ecology of murrelets and shearwaters in the North Pacific and the western Bering Sea, again based on

specimens from drift-gillnet fisheries; the at-sea distribution of Short-tailed Albatrosses (*Phoebastria albatrus*), Mottled Petrels (*Pterodroma inexpectata*), and Thick-billed Murrelets in the North Pacific and Bering Sea; the at-sea ecology of Short-tailed Shearwaters (*Puffinus tenuirostris*) and Tufted Puffins (*Fratercula cirrhata*); and the mortality of seabirds in the Japanese drift-gillnet salmon fishery. He also began his first research on organochlorines contamination in seabirds, heavy-metals concentrations in zooplankton prey eaten by seabirds, and avian influenza in migrant shorebirds.

The 1990s brought another flurry of publications. Professor Ogi published or coauthored papers on topics as diverse as the contamination of seabirds by heavy metals and plastic pollution; migratory dynamics of seabirds as indicated by stable isotopes; the breeding ecology of Spectacled Guillemots (*Cephus carbo*) and Black-tailed Gulls (*Larus crassirostris*) in Japan; the parasitology of seabirds; the at-sea distribution and abundance of Short-tailed Albatrosses and Mottled Petrels; conservation issues facing nesting Streaked Shearwaters (*Calonectris leucomelas*) in Japan; the feeding ecology of Sooty Shearwaters (*Puffinus griseus*) in the North Pacific and of murrelets caught in coastal Japanese fisheries in winter; and conservation issues facing Black-footed Albatrosses (*Phoebastria nigripes*). He also coauthored an important paper on the mortality of seabirds in the highly controversial drift-gillnet fishery for neon flying squid (*Ommastrephes bartramii*) in the oceanic North Pacific.

Although he retired from Hokkaido University in 2002, Professor Ogi continued publishing on a variety of topics. However, his recent interests have shifted more toward studies of the contamination of seabirds and conservation issues facing seabirds and the oceans. Papers that he has published or coauthored since 2000 include topics such as the transfer of contaminants from adult Black-tailed Gulls to their eggs; conservation issues facing nesting Streaked Shearwaters

in Japan; contamination of the oceans and beaches by plastic pollution and their accompanying PCBs; and seabird bycatch issues.

Perhaps Professor Ogi's most significant contributions, in his career of major contributions, have been in his research on the at-sea feeding ecology of seabirds and on the bycatch mortality of seabirds in Japanese fisheries. Many of the feeding studies have involved analyses of birds from remote parts of the Bering sea and the oceanic North Pacific; it is not too strong a statement that, without his research, we would have no understanding at all of this important phase in the annual life cycle of seabirds. In addition, his work on seabird bycatch provided important glimpses into a conservation issue about which most North Americans were unaware.

EDUCATION, COOPERATION, AND INSPIRATION

One of Professor Ogi's biggest contributions has been the recruitment and guidance of students interested in seabird ecology. Ogi-san and his students salvaged specimens from fisheries bycatch and examined diet, skeletal characteristics, breeding status, and contamination of seabirds by hydrocarbons, plastic pollutants, and heavy metals. During his time as a faculty member at Hokkaido University, Professor Ogi was an advisor for many graduate students who were studying seabirds; he also was on the graduate committees of numerous students who were studying other aspects of marine ecology.

Dr. Ogi encouraged many scientists, especially those interested in seabirds, in at-sea research. Terry Wahl, an ornithologist in Washington state, credits Ogi-san's influence in having a major influence on his career. Terry was interested in the opportunity to study seabirds from Japanese fishing boats. Ogi-san made the arrangements for the trip and arranged for a graduate student to meet Terry, tour Hokkaido, and get him aboard the R/V *Oshoro Maru*, a fisheries-research ship that belonged to Hokkaido University.

Terry reflected on his time as an observer on Japanese vessels: "Fortunately, they made up in English what I totally lacked in Japanese. Altogether, my introduction to some of the Japanese culture (at least at sea) over several cruises was due in part to Dr. Ogi."

When Robert Day was an oceanography graduate student at the University of Alaska in the 1980s, he also was encouraged by Professor Ogi. Day studied the macroscale distribution and abundance of seabirds in the oceanic North Pacific on the *Oshoro Maru*. In addition, Professor Ogi graciously helped an assistant of Day's (the late Michael Newcomer), who was collecting data for him while with Professor Ogi on the R/V *Hokusei Maru*, another of Hokkaido University's fisheries research ships. Unfortunately, because the *Hokusei Maru* always left Hakodate before the *Oshoro Maru* did, Bob was able to meet Professor Ogi only once, when the *Hokusei Maru* was delayed in leaving port.

A LIFETIME OF CONTRIBUTIONS

Although retired from Hokkaido University, Dr. Ogi still is active in ornithology. He now is a Visiting Researcher at the Yamashina Institute for Ornithology, serves as an adviser to the Japanese Seabird Group, and is an academic adviser to the Wild Bird Society of Japan. Dr. Ogi received the Yamashina Award from the Yamashina Institute for Ornithology in 2000. This award is presented to an individual who has made remarkable and important contributions to the development of Japan's ornithology or to the protection of Japanese birds.

Professor Ogi truly embodies PSG's goals: to increase the quality and quantity of seabird research by facilitating the exchange of information, to identify threats to seabird populations, and to provide government agencies and others with expert advice on eliminating those threats and managing populations. Professor Ogi is receiving the Pacific Seabird Group's Lifetime Achievement

Award for his long-term contributions to the study and conservation of Pacific seabirds, and for his role as a founding member of the Pacific Seabird Group.

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永年功労賞：小城春雄氏

Lora L. Leschner and Robert H. Day

小城春雄氏は1940年に東京に生まれ、海洋生態学を学び1969年には水産学の学位を取得、紅鮭 (*Oncorhynchus nerka*) の食性の研究で1971年に修士号を取得した。1970年代に北海道大学で海鳥の研究を始め、ウミガラス (*Uria aalge*) とハシブトウミガラス (*U. lomvia*) の餌と採食行動の研究をオホーツク海、北太平洋、ベーリング海で行った。博士号取得後は1977年に同大学で助手として働き始め、1980年に教官、1984年に助教授、1995年には教授へと昇格した。2000年に同大学において水産科学科大学院教授に就任し、2002年の退官時に名誉教授となった。

初期の親交と貢献

太平洋海鳥学会創設者の一人である George Divoky 氏が1973年に同学会に関心がある人々の名簿を作成していた際、当時大学院生であり同学会の海鳥研究・保全という目的に強い共感を持っていた小城氏と定期的に連絡を取り合っていた。小城氏は同学会初期の会員の一人であり、その名前は学会会報誌第1号に記載され

ている。

小城氏は1974年12月にワシントン州イサクアで開催された第一回太平洋海鳥学会年次大会には大学院生として参加した。同氏の大会参加のための旅費の一部はオーデュボン協会米国本部から授与され、それは太平洋海鳥学会が初めて受け取った補助金 (500ドル) となった。当時小城氏は海鳥の生態を日本の漁船を使って研究しており、米国でその研究内容を発表するということが日本政府と漁業関係者は大変懸念しているということであった。発表ではウミガラスとハシブトウミガラスの採食習性のデータが次々に紹介されたが、「漁業の混獲によって死んだ何千羽ものウミガラス類からのデータではないか。どうりで日本の漁業組合が小城氏の発表を懸念するわけだ。」と大会に参加していた研究者は言いだした。小城氏は海鳥の採食習性だけでなく、すさまじい数の海鳥が漁業によって混獲されていることも記録していたのだ。

初期の太平洋海鳥学会年次大会においての小城氏の存在は重要で、年

次大会にはるばる遠い国から参加したということだけではなく、小城氏の大会参加によって同学会が真の国際的学会であるというあるべき姿を示すこととなった。小城氏の発表した漁業による海鳥の混獲の研究は、太平洋海鳥学会が奨励しようと望んでいた2つの側面、堅実な海鳥の研究と政府や関連機関が注目すべき重要な保全問題の同定、を持ち合わせていた。小城氏の初期の年次大会への参加とそこで発表された研究論文は、北太平洋とベーリング海での混獲の減少を目的とした同学会初期の海鳥保全活動を活性化することとなった。そして小城氏は1976-1977年には環太平洋地域代表として執行委員を務めた。

小城氏は第一回太平洋海鳥学会年次大会において、生涯の親友達を得ることとなった。George Divoky 氏は第一回年次大会開催を手伝っていた際、小城氏に会場の隅に来るように言われ日本ガモの飾りのついたネクタイピンを渡されたが、残念ながらこの時ばかりはいつもの Divoky 氏らしくなく言葉が出なかった。小城

氏の嬉しそうな顔とその儀式的で礼儀の正しい贈り物の渡し方に対して Divoky氏が何もお返しする物を持ち合わせていなかった事は、Divoky氏が今までにないくらい自身の事を“無教養なアメリカ人”と思わせる出来事だった。

当時ワシントン大学で大学院生としてウトウ(*Cerorhinca monocerata*)を研究していたLora Leschnerは、第一回年次大会では小城氏の案内役となり、それがきっかけとなり現在は35年来の親友である。小城氏はイサクアの年次大会では宿泊費を省こうとLeschnerの自宅に宿泊していた為、大会会場との行き来は多くの大学院生達と車に乗り合わせる事となった。会場までの往復では同氏は自身の海洋での研究や日本での生活について皆と話した。小城氏はその後も日本国内で発表された自身の研究論文を長年Leschnerや同学会内の他の友人達と共有してきた。

小城氏は1996年6月に北海道羽幌町で行われた第一回日米海鳥シンポジウム/ワークショップの主催者の一人で、会合のテーマは海鳥の保全であった。同氏は太平洋海鳥学会を通じて知り合った北米の研究者を招じて、米国とカナダで行われている海鳥保全対策が日本国内でも、特にウトウの世界最大級の営巣地であり猫を可愛がる人々が多い漁村が存在する天売島における海鳥保全にも応用できるということを、日本の政府関係者や環境保護に携わる人々に伝えてもらった。訪日した研究者達は海鳥を保護するための漁業規制、デコイ(模型)を使った営巣地へのウミガラスの呼び寄せ、海鳥の研究、そして猫のような天敵が海鳥の営巣地を脅かす影響などについて話し合った。

幅広い研究に関心を持つ研究者

小城氏は長年にわたり、北太平洋とベーリング海における海鳥の海洋生態、海鳥の保全、海洋生態全般についての知識を深めるにあたって多大な貢献をしてきた。小城氏の発表してきた研究論文のリストの一部(下記参照)を一目見るだけで、いかに小城氏の海洋生態、特に海鳥の生態と保全に関する研究への関心が幅広いかをうかがえる。

小城氏は海洋生態学と人間が引き起こしている海洋生態系への脅威を

専門的に研究し、下記の研究に関して著者又は共著者として数多くの論文を発表してきた；海鳥の食性、海鳥の海洋における生息分布と個体数、ミズナギドリとアホウドリの海洋生態と換羽、漁業による海鳥の混獲、海鳥と海洋のプラスチック汚染、海鳥の繁殖生態、海鳥の寄生虫、鳥インフルエンザ、炭化水素・プラスチック・重金属による海鳥の汚染、海鳥の保全。

小城氏の研究に対する関心は長年の間に変化してきたが、主として海鳥に関する研究に専念してきた。1970年代には鮭の流し刺し網漁により混獲されたウミガラスとハシブトウミガラスを使って、ベーリング海東部とオホーツク海における食性を研究した。1980年代には北太平洋とベーリング海西部で刺し網漁によって混獲されたウミガラス類とミズナギドリ類の食性、アホウドリ(*Phoebastria albatrus*)、マダラシロハラミズナギドリ(*Pterodroma inexpectata*)、ハシブトウミガラスの北太平洋とベーリング海における分布、ハシボソミズナギドリ(*Puffinus tenuirostris*)とエトピリカ(*Fratercula cirrhata*)の海洋生態、流し刺し網を使った日本のサケ漁による海鳥の死亡率の研究論文を著者又は共著者として発表した。小城氏は又海鳥の有機塩素化合物の汚染、海鳥の餌となる動物プランクトンの重金属濃度、渡り千鳥の鳥インフルエンザの研究も同年代に始めた。

1990年代には小城氏は著者もしくは共著者として関わった下記のような幅広い分野での研究を発表した；海鳥の重金属とプラスチックによる汚染、安定同位体を用いた海鳥の渡りの解明、日本におけるケイマフリ(*Cephus carbo*)とウミネコ(*Larus crassirostris*)の繁殖生態、海鳥の寄生虫、アホウドリとマダラシロハラミズナギドリの海洋分布、日本で繁殖中のオオミズナギドリが直面する保全問題、北太平洋におけるハイイロミズナギドリ(*Puffinus griseus*)と冬季の日本の沿岸漁業によって混獲されたウミガラス類の食性、クロアシアホウドリ(*Phoebastria nigripes*)が直面する保全問題。小城氏は又、大いに議論を呼んでいる北太平洋におけるアカイカ(*Ommastrephes bartramii*)の流し刺し網漁の混獲による海鳥の死亡率に関しての重要な論文を共著し発

表した。

北海道大学を2002年に退官した後も、小城氏は様々な分野の研究論文を発表し続けており、近年は主に海鳥の環境汚染や海鳥と海洋環境が直面している保全問題の研究に力を注いでいる。2000年以降に著者もしくは共著者として発表している論文は、ウミネコの親鳥から卵への汚染物質の移行、日本で繁殖中のオオミズナギドリが直面する保全問題、プラスチックとそれに付随するPCBによる海洋と浜辺の汚染、海鳥の混獲問題に関する研究等である。

海洋における海鳥の食性と日本漁業の混獲による海鳥の死亡率に関する研究は、小城氏の研究の中でも最も著しい貢献であろう。小城氏の食性に関する多くの研究には、ベーリング海と北太平洋遠隔地からの海鳥の解析が含まれており、海鳥の年間の生活の中でもこのような重要な期間に関する知識は同氏の研究をなくしては得られなかったといっても過言ではないだろう。更には小城氏の海鳥の混獲に関する研究が、北米では知られていなかった問題に光を与えるきっかけをつくる事となった。

教育、共同研究、感化

小城氏の最も重要な貢献の一つは、海鳥に関心のある学生の勧誘と指導である。小城氏は混獲された多くの海鳥を回収し、海鳥の採食、骨格の特徴、繁殖状況、炭化水素・プラスチック・重金属による汚染を生徒達と研究した。北海道大学の教員を務めていた際は、海鳥の研究をしている多くの学生達の顧問教官であり、海洋生態の他の側面を研究している大勢の学生達の顧問委員でもあった。

小城氏は多くの研究者、特に海洋での海鳥の研究に関心を持つ研究者達を激励した。ワシントン州の鳥類学者であるTerry Wahl氏にとっては、小城氏の存在が彼の将来に大きな影響を及ぼした。Wahl氏は日本の漁船を使つての海鳥の研究に関心があり、小城氏はWahl氏の旅、そして大学院生との引き合わせを手配し、更には北海道案内をして、北海道大学の水産調査船である「おしよる丸」に乗船させた。Wahl氏は当時の船上での観察員である頃を振り返り「幸運なことに、自分が日本語で話せな

かった事は日本人が英語で話をしてくれた。航海中にこのように日本の文化に初めて触れたことは小城氏のおかげである」と話している。

アラスカ大学で海洋学専攻の大学院生だったRobert Dayも又、1980年代に小城氏に勇気づけられた。Dayは「おしょろ丸」に乗船して北太平洋で広範囲にわたる海鳥の分布と個体数を研究していた。小城氏は北海道大学水産調査船「ほくせい丸」でDayのためにデータの収集を行っていた助手（故Michael Newcomer氏）を親切に手伝った。「ほくせい丸」はいつも「おしょろ丸」よりも早く函館を出航してしまうため、残念なことにDayは「ほくせい丸」の出航が遅れた際の一度のみ、小城氏に会う機会があっただけであった。

長年にわたる貢献

小城氏は北海道大学を退官した後にも積極的に鳥類学の研究を行っている。現在は山階鳥類研究所客員研究員、日本海鳥グループ顧問、日本野鳥の会の学術顧問を務めている。2000年には、日本の鳥類学の発展、又は鳥類保全に著しく重要な貢献をした人に山階鳥類研究所から授与される山階賞を受賞した。

小城氏は太平洋海鳥学会の目的である海鳥に関する研究の増加と質の向上を、情報交換の促進、海鳥への脅威の同定、政府機関や他の機関に対して海鳥への脅威を減少させ個体群を管理するために必要な専門的な助言によって真に体现してきた。

太平洋の海鳥に関する研究と保全への長年にわたる貢献、そして学会の創始者の一員としての役割に対し、太平洋海鳥学会から小城氏に永年功労賞が授与された。

訳：オレゴン州立大学、鈴木康子 (Translation: Yasuko Suzuki, Oregon State University)

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SPECIAL ACHIEVEMENT AWARD: YUTAKA WATANUKI

James Lovvorn



At its annual meeting in Hakodate, Japan in February 2009, the Pacific Seabird Group presented a Special Achievement Award to Yutaka Watanuki. This award is presented periodically to an individual who has provided exceptional, long-term service to PSG, or who has shown outstanding and exemplary accomplishment in seabird research, education, or conservation. In fact, Yutaka has an extraordinary record on all these counts. Yutaka is the tenth recipient of this award since its establishment in 1993, and the second from Japan (along with Hiroshi Hasegawa).

One of the stated goals of PSG when it was formed was to increase seabird research by facilitating exchange of information, with the geographic scope being the entire Pacific Basin. Among PSG members, there are very few who rival Yutaka in promoting exchange of information across the Pacific Ocean, and fostering collaborative research not only among workers in the Pacific region but also the North Atlantic, Arctic, and Antarctic. Beyond his own initiatives, Yutaka has shown exceptional dedication to guiding students along the same path. At PSG's annual meetings (which he began attending in 1994), Yutaka brings several

students with him from Japan. We have all benefited from seeing their unique and high-quality work, and have gained valuable insights from conversations with them. Yutaka has had the vision to know that his legacy of communication and collaboration will have lasting impact only if he instills the same values in students. His commitment to this approach has not been occasional, but every year for the last decade and a half.

Yutaka is currently an Associate Professor in the Graduate School of Fisheries Sciences at Hokkaido University. He is co-leader of the Laboratory of Marine Ecology, where there are currently 27 graduate students at M.S. and Ph.D. levels. Over the last three decades, Yutaka and his students have worked on an array of seabird species. In the Northern Hemisphere, he started at Hokkaido University with his M.S. thesis (1983) on behavioral interactions between Leach's Storm-Petrels (*Oceanodroma leucorhoa*) and Slaty-backed Gulls (*Larus schistisagus*), followed by his Ph.D. dissertation (1987) comparing the diets and breeding biology of Slaty-backed and Black-tailed (*L. crassirostris*) Gulls. Since then he has also published work on Black-legged Kittiwakes (*Rissa tridactyla*), Streaked Shearwaters (*Calonectris leucomelas*), and Japanese Cormorants (*Phalacrocorax capillatus*), with some of his best recent research on the diving behavior of European Shags (*Phalacrocorax aristotelis*), Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*), Rhinoceros Auklets (*Cerorhinca monocerata*), and Razorbills (*Alca torda*). In the Southern Hemisphere, he has studied Emperor (*Aptenodytes forsteri*), Macaroni (*Eudyptes chrysolophus*), and especially Adélie (*Pygoscelis adeliae*) Penguins, as well as King Cormorants (*Phalacrocorax atriceps*). When not researching birds, he also managed to publish several papers on Japanese monkeys (*Macaca fuscata*). Since 1982, Yutaka has authored or co-authored close to 100 scientific papers.

Throughout his career, Yutaka has continued traditional ecological studies on the diets and breeding biology of a variety of seabird species. Over the last 17 years he has maintained a long-term seabird monitoring program on Teuri Island, which has the world's largest Rhinoceros Auklet colony at over 300,000 pairs. This year he will receive the Oshima Prize from the Japanese Society of Ecology for his work on Teuri Island.

Outside Japan, Yutaka is perhaps best known for his work with bird-borne electronic devices. In particular, he has made outstanding contributions through use of micrologging accelerometers, which have revealed a great deal about how birds regulate the allocation of energy throughout dives. He and his colleagues have shown that various alcids, cormorants, and Little Penguins (*Eudyptula minor*) alter their speeds and stroke rates throughout dives to offset changes in buoyancy, probably to keep work per stroke against drag and buoyancy combined within a relatively narrow range. (Watanuki et al. 2003, Lovvorn et al. 2004, Watanuki et al. 2005, 2006). He recently contributed to a paper with Katsufumi Sato (Sato et al. 2007) showing that over a very wide range of body mass from cormorants to killer whales (*Orcinus orca*), stroke rates decrease allometrically as body mass increases,





Watanuki persuading cormorant . . .

while mean swim speeds stay between 1 and 2 m per second no matter how large the animal.

This valuable collection of data begs many questions about why there is such remarkable constancy of swim speed regardless of body size. This pattern may reflect inherent constraints of muscle function or fluid dynamics, but perhaps not. Interestingly, alcids ranging in size from Rhinoceros Auklets to murrets did not follow the scaling rule. This discrepancy suggests that retaining the ability to fly both in air and water

results in differences in wing size or muscle function that make it hard to generalize from larger birds to alcids. In that regard, Yutaka has also worked with Yasuaki Niizuma and others to determine that, in contrast to larger penguins and cormorants whose body temperatures can fall substantially during dives, body temperatures in Thick-billed Murrets stay high throughout dives (Niizuma et al. 2007). This finding again suggests that the diving energetics of alcids may differ from that of larger penguins or cormorants, stimulating further research to find explanations.

As useful as data on dive depths, swim speeds, and acceleration patterns are, there is still much to learn about habitat use and food-searching methods. More recently, Yutaka has started exploring the use of miniature video cameras attached to the birds (Watanuki et al. 2008), which should eventually revolutionize our understanding of habitat and prey relationships of species large enough to carry these devices.

In Japan, Yutaka is part of a group of outstanding scientists who are working hard to develop new logger technology and to discover new ways to apply that technology to important questions. But Yutaka has also done an impressive job of working with a variety of people throughout the world to spread the use of that technology. On the Isle of May in Scotland, in particular, he has collaborated with the group of Sarah Wanless, Mike Harris, and



. . . and instructing students

Francis Daunt to study the diving patterns of alcids and cormorants. His work to organize the annual PSG meeting in Hakodate, including the symposium on use of new approaches to studies of diving in seabirds, reflects Yutaka's commitment to spreading the word about new methods and finding novel opportunities to apply them.

Yutaka has been active in a variety of meetings that promote communication among researchers as well as conservation initiatives. He is a member of the PICES Advisory Panel on Marine Birds and Mammals, and at the 2006 PICES meeting in Yokohama he convened (along with Syoichiro Minobe and Bill Sydeman) a workshop entitled "Response of marine mammals and seabirds to large-scale and long-term climate change: mechanisms of environmental forcing." In Hakodate in 2007, he hosted the Third Joint China-Japan-Korea GLOBEC Symposium on the relationship between environmental variation and ecosystem responses in the northwest Pacific. At the 2001 PSG meeting in



With students at research camp on Ogasawara . . .



. . . and in the rain

Hawaii, Yutaka organized (with Harry Carter, Kim Nelson, and Koji Ono) a symposium on the “Biology, status, and conservation of Japanese seabirds”; proceedings were later published in the *Journal of the Yamashina Institute for Ornithology*. Yutaka was Chair of the local committee for the annual PSG meeting in Hakodate in 2009, where he organized a symposium entitled “Working beneath the surface: new approaches in examining the interplay of biomechanics, physiology and behavioral ecology in diving seabirds.” A series of papers presented at this symposium were recently published (*Aquatic Biology* 8[3], 2009).

As a collaborator, Yutaka is well known for his hard work, good humor, generosity, and complete dedication to science, seabirds, and the people he has worked with. His strong and consistent commitment to student training and communication among researchers throughout the world is exemplary. Yutaka has provided a pan-Pacific

dimension to this organization that has been invaluable. The Pacific Seabird Group is especially honored to present a Special Achievement Award to Yutaka Watanuki.

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特別功労賞：綿貫豊氏 Jim Lovvorn

2009年2月函館で開催された太平洋海鳥学会年次大会において、特別功労賞が綿貫豊氏に授与された。特別功労賞は学会のために特別な奉仕を長期にわたって行ってきた人、もしくは海鳥に関する研究、教育、保全において特別な業績を達成した人に贈られる賞であり、綿貫氏は上記のすべての分野において秀でた業績を残している。1993年に特別功労賞が設立されて以来綿貫氏は十人目の受賞者であり、日本の研究者では二人目となる（長谷川博氏が同賞を受賞）。

太平洋海鳥学会が設立された当初の学会目的の一つは太平洋域研究者間の情報交換による海鳥研究の促進であったが、太平洋を越えての情報交換の促進や、太平洋のみならず北大西洋、北極、南極における共同研究の推進においても綿貫氏に並ぶ人は学会会員内においても非常に少ない。自身の研究のみならず学生の指導にも非常に熱心であり、綿貫氏が1994年に参加を始めた太平洋海鳥学会年次大会には日本から学生達も数名ずつ参加させている。綿貫氏の学生達による高度で独特な研究から、そして彼らとの会話で見うけられる洞察から私達は貴重な事を学ぶことが多くある。綿貫氏には先見の明があり、これまで行ってきた共同研究や他の研究者達との情報交換は、学生達にその重要性を教えることによつてのみ長期間に及ぶ効果を生み出せるということを理解している。このような綿貫氏の熱心な教育への取り組みは、15年間前から毎年継続されてきていることである。

綿貫氏は現在北海道大学大学院水産科学研究院の准教授であり、27名の修士、博士課程の大学院生が所属する資源生物学講座（資源生態学領域）において共同指導教官を務め、これまで30年以上にわたり学生達と多くの海鳥の研究を行ってきた。北半球における研究では、コシジロウミツバメ(*Oceanodroma leucorhoa*)とオオセグロカモメ(*Larus schistisagus*)の行

動学的相互作用の研究で北海道大学において修士号を取得(1983)した事に始まり、オオセグロカモメとウミネコ(*L. crassirostris*)の採食・繁殖生態の比較の研究では同大学で博士号を取得した(1987)。その後はミツユビカモメ(*Rissa tridactyla*)、オオミズナギドリ(*Calonectris leucomelas*)、ウミウ(*Phalacrocorax capillatus*)の研究、そして近年は綿貫氏の得意とする潜水行動学をヨーロッパヒメウ(*Phalacrocorax aristotelis*)、ウミガラス(*Uria aalge*)、ハシブトウミガラス(*U. lomvia*)、ウトウ(*Cerorhinca monocerata*)、オオハシウミガラス(*Alca torda*)の研究で発表している。南半球においては、コウテイペンギン(*Aptenodytes forsteri*)、マカロニペンギン(*Eudyptes chrysolaemus*)、アデリーペンギン(*Pygoscelis adeliae*)、オオグロムナジロヒメウ(*Phalacrocorax atriceps*)の研究も行っており、鳥類以外には、日本ザル(*Macaca fuscata*)の研究も発表もした。1982年以来、著者又は共著者として発表した科学論文数は100報近くとなる。

綿貫氏は様々な海鳥の種類における採食・繁殖生態を従来の生態学的方法を使って研究を行っており、ウトウが300,000つがい営巣する世界最大の繁殖地である天売島では、17年にも及ぶ長期の海鳥の観察、調査を行ってきた。2009年には天売島での研究の功績が認められ、日本生態学会から大島賞を受賞した。

日本国外においては、綿貫氏の研究の中でも海鳥に装着可能な電子記録計を使ったものが最も知られており、特に海鳥が潜水時にどのようにエネルギー配分を調節するのかを解明するにあたり、加速度を測定する超小型データロガーを用いての研究で多大な貢献をした。共同研究者とのデータロガーを用いた研究で、ウミスズメ科とウ科の海鳥、そしてコビトペンギン(*Eudyptula minor*)が浮力の変化に対応するために潜水中の遊泳速度と羽ばたきの頻度を変化させることを明らかにした（水

の抵抗と浮力に対し、羽ばたき1回毎に必要な労力の変動を少なくするためのメカニズムと思われる）(Watanuki et al. 2003, Lovvorn et al. 2004, Watanuki et al. 2005, 2006)。更に最近における佐藤克文氏との共著の論文(Sato et al. 2007)では、ウの様な海鳥からシャチ(*Orcinus orca*)のような大型動物まで、平均遊泳速度は体の大きさに関係なく毎秒1-2メートルであるのに対し、体が大きいほど水中での羽ばたきの頻度は非比例的に少なくなることも明らかにした。

このような貴重なデータを集約する事によって、なぜ遊泳速度は体の大きさに関係なく一定なのかという疑問が沸いてくる。遊泳速度に見られるこのパターンは生まれながらにして持ち合わせた筋肉の機能、もしくは流体力学的なものの反映なのだろうかという考えもあるが、たぶんそうではないであろう。興味深いことに、小型のウトウから大型のウミガラスのように体の大きさの違うウミスズメ科の海鳥では、羽ばたきと体の大きさの関係がこのようなパターンに当てはまらないことが判明した。これはウミスズメ科の海鳥が空中と水中での飛行能力を維持するために、体の大きさに対する翼の大きさ、もしくは筋肉の機能が他の大型の鳥類とは異なっている可能性があることを示している。この他にも綿貫氏は新妻靖章氏や他の研究者との研究により、大型ペンギンやウの体温が潜水中に著しく低下するのに対し、ハシブトウミガラスの体温は潜水中にも高く保たれることを測定した(Niizuma et al. 2007)。この発見もまたウミスズメ科が潜水時に費やすエネルギーが大型のペンギンやウとは異なることを示唆しており、原因解明のための更なる研究の励みとなっている。

潜水深度、遊泳速度、加速度パターンに関するデータと同様に有用なのが海鳥による生息域の利用や採食行動に関する情報であり、これらに関しては研究すべきことがまだ多く

ある。綿貫氏は近年小型のビデオカメラを海鳥に装着しての研究も始めており (Watanuki et al. 2008)、比較的大型な海鳥でビデオカメラの装着が可能な種類に関しては、この手法を用いることにより生息地や餌との関係などの知識に革命的な変化をもたらすことになると思われる。

日本国内では綿貫氏は新たなロガー技術の開発とその技術を利用しての重要な研究を懸命に行っている優れた科学者グループの一員であるが、その技術の有用性を国際的に広めることにしても目ざましい貢献をしてきた。特にスコットランドのメイ島では Sarah Wanless、Mike Harris、Francis Daunt 諸氏と共同でウミスズメ科とウ科の潜水パターンの研究を行った。函館の太平洋海鳥学会年次大会においては、新しい技法を使った海鳥の潜水に関する研究の発表の場となるシンポジウムを主催し、このような技術の普及とその技術を新たに利用する機会を模索する綿貫氏の熱心な取り組みが反映された。

綿貫氏は研究者間や環境保全に取り組む機関とのコミュニケーションも様々な会議を通して活発に行っている。北太平洋海洋科学機構では海洋鳥類・哺乳類に関する諮問委員であり、2006年に横浜で開かれた北太平洋海洋科学機構会議においてはワークショップ“大規模及び長期間にわたる気候変動に対する海洋哺乳類と海鳥の反応：環境が及ぼす影響のメカニズム”をBill Sydeman、見延庄一郎の両氏と共に開いた。2007年には函館において太平洋北西部の環境変化と生態系の反応の関係について、第三回中国・韓国・日本間GLOBECシンポジウムを

主催した。2001年にはハワイで行われた太平洋海鳥学会年次大会において Harry Carter、Kim Nelson、小野宏治の諸氏と共にシンポジウム“日本の海鳥の生態、現状、保全”を開き、シンポジウムの会議録は後に山階鳥類学雑誌に掲載された。綿貫氏が開催地委員長を務め、2009年に函館で開催された太平洋海鳥学会年次大会では、シンポジウム“海面下での研究：潜水性海鳥のバイオメカニクス、生理学、行動生態学的相互作用の研究に対する新たなアプローチ”を主催した（同シンポジウムで発表された一連の論文が最近 Aquatic Biology 8[3]、2009に掲載された）。

綿貫氏の研究に対する熱心さ、ユーモアのセンス、寛大さ、そして学術の向上、海鳥保全、共に働く人々への徹底した貢献は共同研究者の間では良く知られている。学生の教育と世界中の研究者達とのコミュニケーションの促進へゆるぎなく一貫して献身する姿勢は模範的であり、綿貫氏の貢献がもたらした全太平洋域という次元は太平洋海鳥学会にとっては計り知れないほどの価値がある。綿貫氏に特別功労賞を授与することは、太平洋海鳥学会にとって大変光栄なことである。

訳：オレゴン州立大学、鈴木康子
(Translation: Yasuko Suzuki, Oregon State University)

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CONSERVATION REPORT, SUMMER 2010

Compiled by Craig S. Harrison

CONSERVATION OF NEWELL'S SHEARWATERS AND HAWAIIAN PETRELS

The populations of threatened Newell's Shearwaters (*Puffinus newelli*) and endangered Hawaiian Petrels (*Pterodroma sandwichensis*) may be declining rapidly, which has prompted several recent actions by the U.S. Fish and Wildlife Service (USFWS) and environmental organizations. Newell's Shearwaters were once part of the diet of native Hawaiians, and they were thought be near extinction until a pig hunter in Anahola Mountains on Kauai discovered a colony in 1967. In the late 1980s the population was estimated to be 4,000 to 6,000. The center of its range is on Kauai, largely because the Indian mongoose (*Herpestes javanicus*) has not become established there. The colonies are very difficult to find and census, which makes accurate populations estimates difficult. During the fledging season (late September to early December), Newell's Shearwaters and Hawaiian Petrels heading to sea are attracted to bright lights such as street lamps and hotels and resorts. Trapped in the glare, confused birds circle repeatedly until they fall to the ground from exhaustion or strike buildings. The "Save Our Shearwater ("SOS") program has operated since the 1980s and has rescued over 30,000 downed shearwaters. According to some estimates, the Newell's Shearwater population on Kauai has declined by 75% from 1993 to 2008.

In May 2010, four environmental groups sued Starwood Hotels, alleging that its St. Regis Princeville Resort is responsible for over one-quarter of downed Newell's Shearwaters on Kauai because the shearwaters are attracted to bright lights at the resort. The complaint alleges that the resort's failure to prevent the ongoing deaths violates the

Endangered Species Act (ESA). The St. Regis resort recently completed a \$100 million renovation that reportedly included some lighting changes. In March 2010, a similar suit was brought against Kauai Island Utility Cooperative, alleging that another significant cause of harm comes from birds hitting the utility's power lines. The U.S. Department of Justice obtained a criminal indictment of the Kauai Island Utility Cooperative in May 2010 for violations of the ESA and the Migratory Bird Treaty Act (MBTA). The utility responded that it has not violated the criminal provisions of either the ESA or the MBTA and is doing everything reasonably possible to protect the seabirds. It stated that it has been working with USFWS to come up with a Habitat Conservation Plan that would allow incidental take of shearwaters and petrels (*Pacific Seabirds* 29:98, 2002; *Pacific Seabirds* 31:52-53, 2004). The utility claimed that it has been working diligently for the past decade with every state and federal government agency and other stakeholders to achieve workable solutions to protect endangered Hawaiian seabirds. PSG has written many letters during the past decade to the utility and to USFWS to try to improve conservation efforts on Newell's Shearwaters (*Pacific Seabirds* 26:11, 1999; *Pacific Seabirds* 27:23, 2000; *Pacific Seabirds* 28:13, 2001).

PROTECTION OF SEABIRDS AT KAENA POINT, HAWAII

The erection of a predator-exclusion fence at Kaena Point, the northernmost tip of Oahu, is slowly moving forward. The fence is designed to eliminate

predation that dogs, cats, mongoose and rats cause to seabirds, including Laysan Albatross (*Phoebastria immutabilis*), at the Kaena Point Natural Area Reserve (*Pacific Seabirds* 35:35, 2008). The final public hearing was held in January 2010 and the project was unanimously approved by the Hawaii Board of Land and Natural Resources. The public is overwhelmingly supportive of erecting the fence and the Packard Foundation has provided funding to remove rodents and to begin work on seabird restoration and social attraction. Unfortunately, an individual filed a contested case appeal, which has delayed construction. It is anticipated that the project will be completed before the Laysan Albatross breeding season begins this winter.

NORTH PACIFIC ALBATROSSES ADDED TO ACAP

The Agreement on the Conservation of Albatrosses and Petrels (ACAP) is an international treaty between fishing nations for the protection of albatrosses and petrels. Many of these wide-ranging seabirds are threatened with extinction or population declines due to poor fishing practices, pollution, and invasive species on their breeding islands. Member nations of ACAP agree to take actions necessary to conserve these birds, including protection of breeding colonies and reducing albatross and petrel bycatch in fisheries. In November 2009, the parties to ACAP unanimously added all three North Pacific species of albatross—Short-tailed Albatross (*Phoebastria albatrus*), Laysan Albatross, and Black-footed Albatross (*P. nigripes*)—to their official list. With these additions, all 22 species of albatrosses together with seven southern hemisphere petrels

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are protected by ACAP. US and Japanese delegates to the meeting in Bergen, Norway, gave a presentation demonstrating how close the objectives of those currently working to conserve these three albatrosses were to those of ACAP, and how mutual benefits would derive from providing the protections of ACAP to these species. In September 2008, President Bush had already submitted ACAP to the Senate for approval, which requires a two-thirds majority.

PSG wrote to Senator Barbara Boxer (D-Calif.) and Congressman Nick Rahall (D-W. Va.) in August 2009, requesting their support for ratification of ACAP and the enactment of implementing legislation (*Pacific Seabirds* 36:6-7, 2009). Boxer and Rahall are key members of Congress because of their positions as chairs of the Senate Environment and House Natural Resources committees; however, to date there has been no progress in either body. Eleven countries are parties to ACAP: Argentina, Australia, Brazil, Chile, Ecuador, France, New Zealand, Peru, South Africa, Spain, and United Kingdom.

ICCAT FAILS TO ACT TO CONSERVE ALBATROSSES

The International Commission for the Conservation of Atlantic Tunas (ICCAT) again failed to take actions to reduce impacts on albatrosses during its annual meeting in November 2009 in Recife, Brazil. ICCAT had conducted a three-year seabird risk assessment, which concluded that tuna and swordfish longline fishing have significant impacts on Atlantic seabird populations. More than 40 fishing nations are members of ICCAT, and they control longline fisheries that each year set hundreds of millions of hooks in the Atlantic. Several proposals during the meeting would have reduced the number of seabirds being killed. No agreements were reached because some members wanted to include mitigation measures that others believe are unproven.

PERU PROTECTS GUANO ISLANDS AND VAST ASSOCIATED MARINE AREA

Peru announced in December 2009 that it has added 22 “guano islands,” 11 peninsulas (guano reserves), and adjacent waters along its coast to its national system of protected areas. This decision is unprecedented in South America. The protected areas cover about 140,000 ha, including waters 3 km offshore. The rich Humboldt Current just off Peru’s coast nourishes the most productive marine ecosystem in the world, attracting millions of seabirds to breed on coastal islands and mainland peninsulas, as well as sea turtles and marine mammals. The twelve seabird species protected include the Peruvian Diving-Petrel (*Pelecanoides garnotii*), which nests in burrows dug into guano. The guano that accumulates at these seabird colonies is a much sought-after organic fertilizer that drove Peru’s economy for decades. The guano islands of Peru were once an international model of excellence in seabird management. After bird populations crashed in the early 20th century due to guano extraction, Peruvian managers implemented strict protections for the islands so that guano could be extracted with minimal impacts to the birds that produced it. These improvements quadrupled the bird populations by about 1960. The guano market crashed with the advent of chemical fertilizers and overfishing of the seabird’s main prey species—the Peruvian anchovy (*Engraulis ringens*). When the once-thriving colonies were left under-protected, many quickly succumbed to introduced predators and human disturbance, including harvest of the birds.

USFWS CONTINUES ESA PROTECTION FOR MARBLED MURRELET

In January 2010, USFWS announced that the threatened Marbled Murrelet

(*Brachyramphus marmoratus*) will remain listed under the Endangered Species Act (ESA). The proposal to delist the species was based on the assertion that the murrelet’s population in Washington, Oregon, and northern California is not distinct from other murrelet populations in British Columbia and Alaska. There have been several attempts to remove the Marbled Murrelet from the list of threatened species during recent years, and PSG has consistently opposed all such efforts.

PSG OPPOSES TIMBER HARVEST IN CALIFORNIA

PSG filed comments with the California Department of Forestry in March 2010 concerning a proposed timber harvest in 14 ha of Marbled Murrelet nesting habitat in northern and central California. PSG explained its concern that the cumulative impacts of multiple timber harvests could significantly impact conservation efforts for this threatened species. PSG noted that the species was listed as threatened in 1992 primarily because of significant losses of its nesting habitat to logging and development in Pacific coastal forests. Moreover, an objective of the Marbled Murrelet recovery plan is to stabilize the population and work for its recovery, by maintaining and/or increasing productivity and removing and/or minimizing threats to survivorship. If murrelets are to have a good chance of surviving over the next 100 years, in spite of the loss or depletion of so much murrelet habitat in California, it is important to protect all remaining habitat, regardless of its size. The current amount of old-growth forest in California has been reduced by more than 96% from pre-logging levels. This is especially serious from Mendocino County south through San Mateo County, where populations have been particularly impacted by the reduced amount of suitable nesting habitat.

The Marbled Murrelet population in Washington, Oregon, and California is

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estimated to be 22,000 birds. Modeling indicates that this population is declining, and that it will be extinct in parts of those states within 100 years, unless the amount and quality of nesting habitat improve and demographic trends recover. Despite PSG's objections, the timber harvest was approved in May 2010. The California Forestry Department concluded, among other things, that if the 14-ha parcel were not logged, it would likely be subdivided into residential property, and the resulting habitat would be even worse for Marbled Murrelets and other forest species.

RADAR RIDGE WIND TURBINE PROJECT

PSG expressed its concerns to the Washington Department of Natural Resources (WDNR) in June 2009 about a proposal to locate 32 wind turbines on state land at Radar Ridge in Pacific County, Washington (*Pacific Seabirds* 36:7-8, 2009). The site is located within the Nemah Marbled Murrelet Management Area. PSG discussed the impacts of this development on Marbled Murrelets, which are listed as threatened under the ESA. The project continues to move forward, and in June 2010 PSG wrote to USFWS concerning the agency's notice of intent to prepare an environmental impact statement. PSG reiterated the concerns that it had previously expressed to Washington State officials, and asked that these issues be included as part of the public scoping process to identify what must be addressed during the environmental review process. PSG is concerned that the location of this particular project will likely result in direct mortality of murrelets that nest adjacent to the facility. There is also significant risk of long-term adverse effects to Marbled Murrelet conservation and recovery on a landscape identified as critical for species recovery. Most of the surrounding forest is identified as critical nesting habitat, because it is important for long-term recovery of

the Marbled Murrelet. The area has been so designated by the federal recovery plan, and also by the Marbled Murrelet Science Team of WDNR.

PSG opposes this wind turbine project because of its potential impacts on a threatened species, for whose recovery the surrounding forest has been designated as critical. PSG does not object to all wind turbine projects in general.

MORE SEABIRDS LISTED AS ENDANGERED

In September 2009 and January 2010, the U.S. Fish and Wildlife Service formally listed five more species as endangered under the ESA: Chatham Petrel (*Pterodroma axillaris*), Fiji Petrel (*Pseudobulweria macgillivrayi*), Magenta Petrel (*Pterodroma magentae*), Galapagos Petrel (*Pterodroma phaeopygia*) and Heinroth's Shearwater (*Puffinus heinrothi*). Population declines in all the species were ascribed primarily to predation by introduced rats, cats, pigs, and dogs, and the adverse effects of non-native invasive plants. The addition of a foreign species to the federal list of threatened and endangered species places restrictions on the importation of either the seabird or its parts.

At the same time, USFWS declined to list the Cook's Petrel (*Pterodroma cookii*) as threatened or endangered, saying its review has shown the species is unlikely to become endangered in a significant portion of its range within the foreseeable future. The Cook's Petrel had been included along with the other five species in the agency's 2007 proposal for listing under the ESA.

VANUATU PETREL SIGHTED

An expedition led by Peter Harrison to New Guinea on the MV *Clipper*

Odyssey in 2010 provided opportunities to observe several rare and little known seabird species. These included the recently rediscovered New Zealand Storm-Petrel (*Oceanites maorianus*), Beck's Petrel (*Pseudobulweria becki*), Heinroth's Shearwaters, Tropical Shearwaters (*Puffinus bailloni dichrous*—formerly classified with Audubon's Shearwater, *Puffinus lherminieri*), Collared Petrels (*Pterodroma brevipes*), Black-winged Petrels (*Pterodroma nigripennis*), Tahiti Petrels (*Pseudobulweria rostrata*) and White-necked Petrels (*Pterodroma cervicalis*).

The most significant sightings and photographs were of Vanuatu Petrels (*Pterodroma occulta*). This species has not been seen at sea for 83 years, and has never before been photographed over the ocean. It was previously known only from seven museum skins, and has only been seen twice since it was originally collected in January 1927. It was observed in the northern Vanuatu Islands, just 60 miles from where the original type specimen was collected by Rollo Beck during the Whitney South Seas Expedition.

The sightings of this long-lost seabird species occurred during the northward voyage from New Zealand to Papua New Guinea. The expedition visited several remote and seldom visited island groups in their quest for seabirds, including New Caledonia, the Vanuatu archipelago and the Solomon Islands. Twenty-one individual Vanuatu Petrels were seen over a three-day period. Sightings culminated on 8 February, when 11 birds were observed during a one-hour period. Of special significance is that nine of these birds were sitting, rafting on the sea just before dusk in front of several offshore rock stacks. These islets may indicate a possible breeding haven for this enigmatic species. In addition to the six specimens collected at sea in 1927 off the island of Mera Lava, Banks Islands, northern Vanuatu, one other specimen was found dead in 1983 on a roadside in New South Wales, Australia. In February 2009, a few Vanuatu Petrels were discovered breeding in the

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mountains of Vanua Lava. The sightings of 21 individual Vanuatu Petrels at sea, in the same geographic area and at virtually the same time of year as the original 1927 sightings, are especially noteworthy. Harrison's observations confirm that the species still exists.

The Vanuatu Petrel was actually described as a distinct species only in 1976. The six original specimens obtained by the American Museum of Natural History Whitney South Sea Expedition in 1927 were not recognized as different from the very similar White-necked Petrel. However, in the 1970s a New Zealand ornithologist, R. A. Falla, recognized it as a smaller, distinct form.

ALASKA MARITIME REFUGE CONTINUES TO REMOVE INVASIVE SPECIES FROM ISLANDS

In February 2010, PSG endorsed the Alaska Maritime National Wildlife Refuge's environmental assessment of its plans to eradicate invasive species and to restore habitat on Tangik, Poa, and Sud Islands. USFWS wants to eradicate exotic European rabbits (*Oryctolagus cuniculus*) from Tangik and Poa Islands in the eastern Aleutian Islands, and to remove introduced hoary marmots (*Marmota caligata*) from Sud Island in the Barren Islands group, Gulf of Alaska. PSG stated its conviction that the removal of invasive species from island ecosystems can provide one the greatest paybacks per dollar spent on wildlife conservation efforts.

RAT ERADICATION IN OGASAWARA ISLANDS

A team led by Dr. T. Hashimoto carried out a large-scale invasive rodent eradication campaign in the Ogasawara

(Bonin) Islands from the end of January to early March 2010. The team dropped diphacinone rodenticide by helicopter. The effort was an attempt to eradicate black rats (*Rattus rattus*) and in some locations house mice (*Mus musculus*) on Mukojima (257 ha), Anijima (785 ha), Otoutojima (530 ha), Nishijima (49 ha), Higashijima (28 ha) and other several small islands and islets. As a separate task, Tatsuo Yabe conducted a survey for rodents on Chichijima (2,395 ha) and Minamijima (34 ha) islands, also part of the Ogasawara Group. Dr. Yabe also reported an earlier attempt to eradicate rats from Nishijima failed, as rats evidently have reinvaded. The International Union for the Conservation of Nature (ICUN) is in the process of evaluating the Ogasawara Islands for possible designation as a World Heritage site.

CHINESE CRESTED TERN UPDATE

PSG has been working to catalyze conservation actions to save the Chinese Crested Tern (*Thalasseusa bernsteini*), based on our Taiwan conference in 2007. To this end, former PSG chair Verena Gill attended the 2009 International Symposium of Chinese Crested Tern. The meeting took place in November 2009 on the Matsu Islands in Taiwan. The Matsu Islands are the main breeding grounds for Chinese Crested Terns and are only 5 km from mainland China. The Japanese biologist Dr Tatsuo Yabe, who specializes in rodent eradication on seabird islands, also attended. The objective of the meeting was to update everyone on results from the 2009 surveys, share information on this species, and to discuss future research.

A synchronized survey was undertaken in 2009 by both the Chinese and Taiwanese, in an effort to count all Chinese Crested Terns and identify new breeding sites. Known breeding sites were surveyed simultaneously on 6 and 21 June, 5 and 19 July, and 12 and 23

August 2009. The maximum total count was 22 individuals (17 adults and 5 chicks) – this is about half of the world's estimated population.

In the spring of 2010, Dr. Yabe began a rat assessment on the Matsu Islands and discovered the lesser rice rat (*Rattus losea*) was present on one island. It is apparently omnivorous and a potential threat to the terns. Plans are now underway for fall 2010 surveys and eventual rat eradication.

MANAGEMENT OF WHITE PELICANS

In May 2010, PSG expressed its concerns to USFWS about the management of White Pelicans (*Pelecanus erythrorhynchos*), especially in the state of Idaho. Idaho officials are taking actions to reduce the numbers of White Pelicans in ways that could be detrimental to the management of the species as a whole. In 2009, the Idaho Department of Fish and Game attempted to obtain a permit under the Migratory Bird Treaty Act to shoot White Pelicans and/or oil their eggs, in order to reduce by half the population of this species in southern and eastern Idaho. USFWS declined to issue such a permit on the grounds that it constituted an inappropriate eradication program. However, recent press reports state that in 2010 Idaho officials have released predators such as badgers (*Taxidea taxus*) and striped skunks (*Mephitis mephitis*) on Gull Island in the Blackfoot Reservoir. Apparently Idaho officials are taking these actions after being pressured by fishermen, who believe that White Pelicans are responsible for eating too many game fish, including Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*).

PSG expressed two primary concerns. First, White Pelicans are protected by the federal Migratory Bird Treaty Act, and releasing predators on a nesting island seems a circumvention

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of the federal permit program, which exists to ensure that all migratory birds are managed rationally. Piscivorous birds are often unfairly blamed for declines in sport fisheries and commercial fisheries, without compelling evidence as to what role (if any) they actually play. Decisions about the management of White Pelicans should be based on rigorous scientific analysis that puts the impacts of pelicans on any particular fish stock into the context of other factors affecting that stock, such as drought or water management for other purposes (e.g., withdrawals for irrigated agriculture).

Our second concern is that releasing predators into any bird colony is problematic. PSG as an organization and its members have spent vast amounts of time, effort and resources to reverse the impacts of predator introductions in

seabird colonies throughout the Pacific. There is no reason to believe that badgers and skunks will “target” their predation to any specific species, and there could be severe unintended consequences from such actions. For example, seabird populations have suffered dramatically from the introduction of foxes to many Aleutian Islands, mustelids to other islands in Alaska, mongooses to islands in Hawaii, brown tree snakes (*Boiga irregularis*) to Guam, and rats to islands around the world.

PSG concluded that White Pelicans in Idaho should be managed in a regional or flyway context. The state of Washington lists the White Pelican as endangered, and Idaho itself considers it to be a species of special concern. Oregon and California might be interested in enhancing their pelican populations

within their boundaries. Pelican populations in all three of these states probably are strongly linked to those in Idaho. Overall, the American White Pelican population in western North America is much smaller than east of the Continental Divide, and management decisions in the west should consider that smaller population level.

PSG urged USFWS to work collaboratively with Idaho officials on White Pelican problems in the spirit of Landscape Conservation Cooperatives, thereby ensuring that management of the species is based on a rigorous scientific approach and multi-state management issues. (Landscape Conservation Cooperatives are consortiums of agencies, states, and other entities that were proposed in 2009 by USFWS, for coordination of work on widespread threats to species.)

MEETING NEWS—FALL 2010

FIRST WORLD SEABIRD CONFERENCE

The first World Seabird Conference is barely a month away! More than 800 participants from at least 40 nations will fill the Victoria Conference Centre in Victoria, British Columbia in early September 2010. Scientific sessions on 8–11 September will feature major symposia, invited papers, contributed papers, posters, films, and workshops. Various committees will meet on 7 September, including PSG's Executive Council.

PRIMARY SYMPOSIA WILL INCLUDE:

- Climate Change Comparative Ecosystem Dynamics of the World's Oceans
- Interactions between Seabirds and Fisheries: A Global Perspective
- Spatial Ecology At Sea: Opportunities and Challenges for Seabird Marine Protected Areas
- Seabird Island Ecology and Restoration: A Global Synthesis

SPECIAL PAPER SESSIONS WILL INCLUDE:

- Interactive Effects of Chemical Contaminants, Parasites, and Stressors on Seabirds
- Seabird Phenotypic Plasticity and Microevolution

- Marine Debris
- Seabird Demography
- Technological and Analytical Innovation in Seabird Research
- Longterm Monitoring
- Evolutionary and Conservation Genetics of Seabirds
- Seabirds and Economy: Are We Missing the Link, or the Entire Ark?
- Managing Forage Fisheries for Feed, Food, and Prey

The chair of the Scientific Program Committee is Patrick Jodice (Pjodice@clemson.edu).

WORKSHOPS

A dozen interrelated workshops will consider the enhancement of international cooperation in seabird work.

- Introduction to the Aims of the Legacy Workshops
- Seabirds.net (Web portal for seabird professionals)
- Introduction to Linking Seabird Databases
- Distributed Versus Centralized Databases: Decision Points
- World Seabird Colony Register
- Seabird Tracking Databases
- Seabird At-Sea Survey Databases

- Seabird Productivity and Population Indices
- World Seabird Monitoring database
- World Seabird Governing Committee
- Tracking and At-Sea Database Intercommunication
- Mortality Events

Evening social activities will include poster sessions, a film festival, and a banquet. Registration for the conference is still open. For more information, see the conference's website, <http://www.worldseabirdconference.com>

The International Steering Committee includes representatives of more than two dozen professional seabird organizations worldwide. Its chair is David Irons (David_Irons@fws.gov). The conference is being supported by a number of government and private donors (donations of any size are welcome).

The First World Seabird Conference will provide an unprecedented forum for the exchange of information among seabird scientists. In addition, the Legacy Workshops should lead to a new level of international collaboration. The conference is likely to influence seabird science and conservation for many years to come.

REGIONAL REPORTS FOR 2009

Regional Reports summarize current seabird work of interest to PSG members. Regional Reports generally are organized by location of the work, not by affiliation of the biologist. They should not be cited without permission of the researchers.

ALASKA

Compiled by Heather Renner

BRACHYRAMPHUS MURRELETS

Matt Kirchhoff (Audubon Alaska), **Sadie Wright** (Endangered Species, Alaska Department of Fish and Game [ADFG]), and **Karen Blejwas** (Non-game, ADFG) were principal investigators on surveys of *Brachyramphus murrelets* in Glacier Bay, Alaska. Field crews completed 3 resurveys of a set of transects that were established by the U.S. Fish and Wildlife Service (USFWS) in 1993. Preliminary results show the density of Marbled Murrelets (*B. marmoratus*) was unchanged, and the density of Kittlitz's Murrelets (*B. brevirostris*) increased relative to 1993 levels. Field crews also monitored murrelet attendance patterns, activity budgets, dive characteristics, and prey-capture success in habitats with varying levels of glacial influence. A report on the Glacier Bay studies will be available at year-end.

Mayumi Arimitsu of the U.S. Geological Survey (USGS) finished her MS in fisheries at the University of Alaska Fairbanks (UAF) School of Fisheries in Juneau. She studied prey availability and environmental gradients relative to glacial features in Kittlitz's Murrelet foraging habitat in Kenai Fjords National Park, Alaska during 2007–2008.

Michelle Kissling (USFWS) and **Scott Gende** of the National Park Service (NPS) continued research on Kittlitz's Murrelets in Icy Bay. In 2009, they captured and banded 209 [*that's not a typo!*—Editor] Kittlitz's and 23 Marbled Murrelets. They included six Kittlitz's Murrelets that were banded in previous years (2007 and 2008). They attached radio transmitters to 30 adult and one hatch-year Kittlitz's Murrelet

and located birds throughout the breeding season. In addition, they conducted at-sea surveys, monitored active nests, collected blood and feather samples for genetic and diet information, and conducted at-sea behavioral watches. This project involves multiple partners and will continue through the 2011 field season.

In 2009, several PSG members began the first year of a two-year project, funded by the National Fish and Wildlife Foundation, to research Kittlitz's Murrelet habitat and prey in Prince William Sound. The Principal Investigator is **Priscilla Post Wohl** (The Northern Forum, Inc.); **Kathy Kuletz** and **David Irons** (USFWS) and **John Piatt** (USGS) designed and supervised the project. Objectives for 2009 included (1) capturing approximately 30 Kittlitz's and collecting feather and blood samples for stable isotope analysis, and 2) repeating transects designed and surveyed by Kuletz et al. in 2001, to update estimates of relative abundance distribution of Kittlitz's in Prince William Sound. The 2009 field crew was **Andrew Allyn** (University of Massachusetts Amherst), **Aly McKnight** (USFWS), and **Peter Crommett** (volunteer). Capture work began in the final week of April. They consulted **Michelle Kissling** on how to find nighttime loafing locations and received hands-on training from **Tom Bloxton, Jr.** (U.S. Forest Service). Thirty-nine Kittlitz's were captured and sampled, including eight mated pairs. In addition to collecting blood and feather samples for stable isotope analysis, the crew deployed radio transmitters on 12 birds. Tagged individuals were monitored through (1) boat-based tracking to collect fine-scale behavioral data, and (2) presence/absence sampling using remote data-logging stations to record daily and seasonal movements in

a glacial fjord system of northwestern Prince William Sound. In July, the field crew resurveyed the 17 bays and fjords surveyed in 2001 to determine estimates of the relative abundance and distribution of Kittlitz's in Prince William Sound. The work completed in 2009 will be instrumental in fine-tuning plans for the second year of research (summer 2010), which will be a more intensive investigation of Kittlitz's distributions in relationship to a suite of environmental and biological variables.

Jennifer Boisvert, **Bob Day**, **Lauren Attanas**, and **Adrian Gall** (all of ABR, Inc.) conducted land-based surveys for breeding Kittlitz's and Marbled Murrelets near Valdez in June and July. In the north of Alaska, Bob and Adrian conducted at-sea surveys for Kittlitz's Murrelets near Point Barrow in late August. Day is compiling a synthesis of data on Kittlitz's Murrelets in northern Alaska for USFWS.

In the western Aleutians, **Robb Kaler** and **Leah Kenney** continued breeding demography work on Kittlitz's murrelet at Agattu Island. They found 17 active nests this year, of which only one fledged a chick, similar to poor reproductive results in 2007. Robb and Leah were able to refine their search image for Kittlitz's nests and found many former nest sites occupied in previous years that were not active in 2009.

GULF OF ALASKA

Seabirds at St. Lazaria Island were monitored this year by the outstanding crew comprised of **Carrie Hisaoka**, **Jordan Lawrence**, **Danette Perez**, and **Leslie Slater** of Alaska Maritime National Wildlife Refuge (AMNWR). Data were collected on Fork-tailed and Leach's Storm-Petrels (*Oceanodroma furcata*

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and *O. leucorhoa*), Pelagic Cormorants (*Phalacrocorax pelagicus*), Glaucous-winged Gulls (*Larus glaucescens*), Pigeon Guillemots (*Cepphus columba*), Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*), Tufted Puffins (*Fratercula cirrhata*), and Rhinoceros Auklets (*Cerorhinca monocerata*). The goal of monitoring was to determine annual productivity, population changes, and chick growth rates. Diet samples were collected from storm-petrels and auklets; blood samples were collected from auklets.

Slater and **Steve Ebbert** visited Sud Island, in the Barren Islands group, in late August to conduct biological surveys on this rarely-visited refuge island. The island was stocked with hoary marmots (*Marmota caligata*) in 1930 by the Alaska Game Commission. Former refuge biologist **Ed Bailey** conducted more intensive surveys on the island in 1975 and documented approximately 500 Rhinoceros Auklet burrows, the only known colony of the species in the Barren Islands. However, no burrows were found in a subsequent visit by refuge biologist **Dave Roseneau** in 1996. No sign of nesting Rhinos were found by Leslie and Steve during their visit, except for seven active burrows in one location and approximately a dozen in another location on the island. Both groups of burrows were along the upper edge of a steep cliff, in habitat not utilized by marmots. Marmots were, however, present in the 1975 colony location and throughout the island in 2009. A motion-sensitive camera confirmed the use of some of the seabird burrows by Rhinoceros Auklets.

Bob Day and **Adrian Gall** (ABR) are conducting bimonthly aerial surveys for Steller's Eiders (*Polysticta stelleri*) in Iliamna and Iniskin bays, western Cook Inlet.

AMNWR staff continued long-term seabird demography monitoring at Chowiet Island, Semidis group, off the coast of the Alaska Peninsula. The 2009

field crew consisted of **Erik Andersen** and **Joann Wang**.

Scott Hatch (USGS) continued research and monitoring of seabirds on Middleton Island in the Gulf of Alaska. Collaborators in 2009 included **Etienne Danchin** and **Pierrick Blanchard**, (Université Paul Sabatier, Toulouse, France) and **Alexander Kitaysky** at UAF. French researchers and their students are doing experimental studies of behavioral ecology in Black-legged Kittiwakes (*Rissa tridactyla*) while Kitaysky is examining rates of telomere sequence loss in known-age kittiwakes. The work was greatly facilitated in 2009 by camp leader **Tim van Nus** (Amsterdam), returning for his third season on Middleton.

Pelagic surveys were conducted in the Gulf of Alaska under **Kathy Kuletz**; see Bering Sea section, below.

PRINCE WILLIAM SOUND

Mary Ann Bishop and **Kathy Kuletz** (USFWS) continued fall and winter seabird surveys in Prince William Sound, concurrent with acoustic and seining studies on Pacific herring (*Clupea pallasii*), as part of the Exxon Valdez Trustees' Herring Restoration Plan. Abundance and habitat use throughout the fall and winter were examined for 42 species of marine birds recorded. The goal is to examine the environmental and habitat factors associated with seabird predation on herring during winter, and ultimately to assess the role of seabird predation in suppressing herring recruitment to the population. Concurrently, the importance of herring to wintering seabirds such as the declining Marbled Murrelet may be highlighted. Surveys were conducted in fall and winter 2008/2009, and will continue in 2009/2010. **Neil Dawson**, who conducted the field work, has drafted a paper on results from this study.

Bishop also will initiate a complementary study starting in fall 2009, with support from North Pacific Research Board. This project will endeavor to capture Marbled Murrelets in Prince William Sound throughout the nonbreeding season to provide data on body condition

at this energetically demanding time of year.

David Irons (USFWS), **Dan Roby** (USGS-Oregon Cooperative Wildlife Research Unit [OSU]), and **Kirsten Bixler** (Oregon State University [OSU]) continued research on Pigeon Guillemots in Prince William Sound. The Pigeon Guillemot has shown no evidence of population recovery since the Exxon Valdez oil spill 20 years ago. Nest predation, particularly by American mink (*Mustela vison*) appears to be the primary limiting factor for guillemot population recovery in some parts of the Sound. In 2009, they compiled and analyzed data on (1) colony counts, (2) at-sea counts (3) guillemot chick diet, (4) brood size, brood reduction, and nesting success, and (5) forage fish abundance from beach seining and aerial surveys. A restoration plan for Pigeon Guillemots at the Naked Island Group in Prince William Sound will be produced upon completion of this study.

Shawn Stephensen (USFWS, Oregon Coast National Wildlife Refuge Complex) successfully defended his Masters thesis at the University of Alaska Anchorage. His work included studies of habitat selection by Kittlitz's and Marbled Murrelets in Harriman Fjord, Prince William Sound, Alaska. Habitat variables and bird presence correlation models were ranked using Akaike's Information Criteria. The highest-ranked models indicated that Marbled Murrelets selected deep, clear water far from glaciers, whereas Kittlitz's murrelets selected turbid, cold, shallow, fresh water close to glaciers.

(See also "*Brachyramphus murrelets*," above.)

ALEUTIAN ISLANDS

Alaska Maritime National Wildlife Refuge staff continued long-term seabird demography monitoring at 2 camps in the Aleutians. **Slade Sappora** and **Allyson Larned** worked with several species including petrels, gulls, oystercatchers (*Haematopus bachmani*) and murres at Aiktak Island. **Scott Freeman**, **Ray Buchheit**, and

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Kyle Morrison monitored demography of petrels, kittiwakes, murres, auklets (Rhinceros Auklet, *Aethia* spp., *Ptychoramphus aleuticus*) and puffins (14 species).

Jeff Williams (USFWS), **Vernon Byrd** (USFWS) and **Gary Drew** (USGS) re-initiated studies of birds at Kasatochi Island in the central Aleutians following the devastating eruptions of the island on August 7, 2008. The eruption happened at the end of the breeding season for Least and Crested Auklets. The bird studies at Kasatochi are part of new long-term, interdisciplinary study that is examining the ecological response to and recovery from the eruption. Surprisingly, many of the formerly nesting birds species returned in spring 2009. Many of the 250,000 Least and Crested Auklets (*Aethia pusilla*, *A. cristatella*) that historically nested there returned to breed in 2009. However, despite active erosion of the new volcanic ash along the coast, the colony site was buried under meters of volcanic ash; there was nowhere for the auklets to nest. Auklets copulated and laid eggs on the bare surface and in the water, but all were abandoned. By late summer auklets were still in the area, but had abandoned attempts to nest and were attending the former colony in low numbers.

In addition to the land-based surveys on Kasatochi, a marine bird, mammal and fish survey (SMMOCI) was conducted around the island in July, led by **Don Dragoo** and with additional crew members **Jeff Williams**, **Gary Drew**, **David Wigglesworth**, **Naomi Bargmann**, **Lisa Climo**, **Nathan Zabel**, **Catherine Berg**, **Bill Bechtol**, **Aaron Baldwin** and **Joe Filipowicz**.

Williams, **Berg**, **Bargmann**, **Barry Sampson**, **Kimi Nelson**, and others conducted seabird counts in July in the Near Islands around Attu, Agattu, and the Semichi Islands. They counted 100,000 seabirds in coastline surveys from skiffs and many thousands more from the M/V *Tiglar* 1 mile offshore. The Near Islands were a former population stronghold of Red-faced Cormorants (*Phalacrocorax urile*) in the 1970s, when over 70,000

were counted. Red-faced and Pelagic Cormorant numbers are about the same (8,000 total) as a similar count in 2003, but are still down from 1970's.

Anticoagulant rodenticide was broadcast by helicopter at Rat Island in fall 2008 to eradicate the introduced Norway rat (*Rattus norvegicus*), in order to restore the native biodiversity of the island, including nesting seabirds (see *Pacific Seabirds* 35:42). The project was a partnership among three entities: AM-NWR, The Nature Conservancy, and Island Conservation. Followup monitoring in spring 2009 indicated no signs of rats, but we discovered non-target mortality of birds, primarily Glaucous-winged Gulls and Bald Eagles (*Haliaeetus leucocephalus*). We plan a thorough review of the project to elucidate the likely pathways of the rodenticide and to evaluate options for mitigating non-target mortality in future projects. Species such as Leach's and Fork-tailed Storm-Petrels, Whiskered Auklets (*Aethia pygmaea*), and Tufted Puffins are expected to recolonize Rat Island. **Jeff Williams**, **Deb Rudis** and **Matt Francis** conducted seabird coastline counts around Segula, Davidof, Khvostof, Kiska, and Little Kiska Islands as comparison sites for birds documented before and after rat eradication on Rat Island. Initial results from last October's eradication on Rat Island are still positive and no rats have been detected on the island.

Rachel Buxton completed the second season of her MS field work on Amatignak Island. Using song meters, she is looking at the re-establishment of seabirds from islands where they were extirpated by introduced predators.

Terry Schick, **Bob Day**, **Matt Macander**, and **Trish Loomis** (ABR Inc.) are continuing their study of habitat use by migratory Aleutian Cackling Geese (*Branta hutchinsii leucopareia*) in the Near Islands (Attu, Agattu, Shemya, and Nizki-Alaid islands), western Aleutians. Current research is focused on Attu Island, where fall migrating geese were observed 2009. The U.S. Air Force is funding this project to help identify potential habitats on other islands, determine their carrying capacity, and

encourage continued recovery of this delisted species.

Alex Bond (PhD student, Memorial University of Newfoundland [MUN], St. John's, Newfoundland) completed his last year of field work for his PhD dissertation on the interaction of auklets and rats at Sirius Point, Kiska Island. He was assisted by field technician **Erin Penney** (MUN). They monitored auklet demography and rat abundance. Least Auklet reproductive success was the lowest since 2002 (0.44 chicks/pair), despite rat abundance being fairly low, similar to 2007 and 2008. Survival from 2007–2008 dipped from the long-term average to 66%, the lowest recorded since monitoring began in 2001. Crested Auklet reproductive success was 0.52 chicks/pair, and survival dipped below 75% for the first time during winter 2008–2009. **Ian Jones** (MUN) conducted searches for Kittlitz's Murrelet on Kiska and made wildlife observations from Gertrude Cove.

BERING SEA AND NORTH PACIFIC

2009 was the second field season of the Bering Sea Integrated Ecosystem Research Program (BSIERP) on and around the Pribilof Islands. The study is funded by the North Pacific Research Board and includes several seabird components, focusing on Black-legged Kittiwakes and Thick-billed Murres. A colony-based component led by **Heather Renner** (USFWS) and **Vernon Byrd** supplements the long-term monitoring already taking place on the islands. The monitoring crew consisted of **Greg Thomson** and **Maureen McClintock** on St. Paul Island, and **Paula Shannon** and **Sarah Thomsen** on St. George. The field crew for the colony-based portion of BSIERP was **Brie Drummond** and **John Warzybok** (USFWS).

The principal investigators for the Seabird Telemetry project are **David Irons** (USFWS) and **Dan Roby** (USGS-OSU). Two field research teams led by **Rosana Paredes** (OSU) and **Rachael Orben** (University of California, Santa Cruz) included team

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members **Dan Cushing**, **Brie Drummond** (USFWS), **Dean Kildaw** (UAF), **Tom Harten** (PolarTREC teacher), **Robert Massengale**, and Warzybok. The teams successfully deployed global positioning system (GPS) loggers, wet/dry activity loggers, and time-depth recorders on chick-rearing Black-legged Kittiwakes and Thick-billed Murres. In addition to determining at-sea foraging distribution and behavior during July and August 2009, **Orben** will be studying the winter distributions of Black-legged Kittiwakes and Thick-billed Murres using geolocation loggers as part of her Masters degree program.

Kathy Kuletz and **Liz Labunski** completed the second of a three-year project for the broad-scale seabird distribution component of BSIERP, with support from the North Pacific Research Board (NPRB). This project will examine seabird distribution relative to oceanographic and biological features of the Bering Sea and ultimately data will be integrated with other components to address changing oceanographic and predator-prey dynamics in the Bering Sea ecosystem. In 2009 we surveyed during 13 cruise legs, for a total of over 29,760 km of transects in the Bering Sea. NOAA vessels and the U.S. Coast Guard (USCG) icebreaker *Healy* provided survey platforms in conjunction with other BSIERP studies. Additional pelagic surveys were conducted with USFWS support in the Gulf of Alaska, the Chukchi Sea and Beaufort Sea. In these waters we joined seven cruises and surveyed approximately 5,500 km. The USCG icebreaker *Polar Sea*, the NOAA vessel *Miller Freeman*, and the AMNWR vessel *Tigllax* provided platforms of opportunity.

Survey data from all of the pelagic surveys will be archived with the assistance of Martin Renner in the North Pacific Pelagic Seabird Database. At-sea observers in 2009 included **Toby Burke**, **Dan Cushing**, **Lucas DeCicco**, **Brian Hoover**, **Nathan Jones**, **Robb Kaler**, **Ivan Kuletz**, **Kathy Kuletz**, **Liz Labunski**, **Aaron Lang**, **Vivian Mendenhall**, **Scott Mills**, **Marty Reedy**, **Alexandra Rose**, **Art SOWls**, **Tom Van Pelt**, **Sophie**

Webb, and **Tamara Zeller**. The BSIERP project will continue through 2010, and the Alaska at-sea observer program will shift focus to Arctic seas with support from the U.S. Minerals Management Service in 2010–2013.

A fine-scale component within BSIERP is the Patch Dynamic Study (PDS), which has three seabird components: colony monitoring, telemetry tracking of breeding Black-legged Kittiwakes and Thick-billed Murres, and at-sea distribution and abundance and diet relative to the prey base. The PDS includes a prey-species component (**Scott Heppell** and **Kelly Benoit-Bird** of OSU) and a northern fur seal (*Callorhinus ursinus*) component (**Andrew Trites**, University of British Columbia, and also lead PI for the PDS). The at-sea component of the Patch Dynamics Study, led by principal investigators **Kelly Benoit-Bird** and **Scott Heppell** (OSU) assessed prey patchiness and abundance in relation to the distribution of foraging seabirds. Surveys of seabird distribution and diets were led by **Kathy Kuletz** (USFWS). At-sea surveys were carried out by **Nathan Jones** and **Brian Hoover** (California State University, Moss Landing Marine Lab), who will be using the data for their Master's projects. Concurrent with seabird and mammal surveys were prey acoustics and trawl sampling. The study area included 200 km around the Pribilof Islands and Bogoslof Island and waters between them. The two teams surveyed a total of 2,553 km of transects, with 247 of those conducted at night using an experimental protocol and night-vision monoculars. Brian and Nathan also collected kittiwakes and murres as part of the diet and trophic interactions study. In addition, **Rob Suryan** (OSU, Hatfield Marine Science Center) collected data on eddies in relation to seabird and fur seal feeding areas, using 2 drifters provided by **Phyllis Stabeno** and **Carol Ladd** (National Oceanic and Atmospheric Administration [NOAA]).

Diet and blood samples of tagged birds in colonies were collected for the Patch Dynamics Study by **Rebecca Young**, **Sarah Youngren**, **Ine Dorresteijn**, and **Thibaut Vergoz** (UAF) for

determination of gender, stable isotope ratios, stress hormone levels, telomere lengths, and diet composition. Samples were taken in collaboration with Drummond and Warzybok of the colony-based BSIERP project (above).

In the southeastern Bering Sea, **Di-ane Calamar Okonek**, **Marian Snively** and **Stephanie Sell** (ADF&G) monitored Black-legged Kittiwake, Common Murre, and Pelagic Cormorant populations and productivity at Round Island, within the Walrus Islands State Game Sanctuary. Productivity on the monitoring plots for murres and kittiwakes was zero, likely due to predation by Common Ravens (*Corvus corax*) and native red foxes (*Vulpes vulpes*). Conversely, productivity of Pelagic Cormorants within the monitoring plots was good (53%).

Rob Suryan is continuing his research with radiotagged albatrosses, looking at foraging and potential molting areas off Alaska.

Greg Balogh arranged to send **Brian Lance** and **Vivian Mendenhall** to the Bering Sea aboard the U.S. Coast Guard Cutter *Munro*. They hoped to follow up on reports that large flocks of Short-tailed Albatrosses (*Phoebastria albatrus*) congregate in September over the western edge of the continental shelf, at the heads of major undersea canyons. Unfortunately the *Munro*'s mission kept it east of the Pribilof Islands, where albatrosses were at low densities.

CHUKCHI SEA, BEAUFORT SEA, AND ALASKA NORTH SLOPE

Dan Rizzolo (USGS) completed his second field season on the comparative ecology of loons nesting on the Arctic Coastal Plain, as part of his PhD program at UAF. This project deployed satellite radios on nesting Red-throated and Yellow-billed Loons (*Gavia stellata* and *G. adamsii*) to examine use of the Chukchi Sea and non-breeding season distribution. Data were also collected on productivity, foraging ecology, and chick growth of Red-throated and Pacific (*G. pacifica*) loons nesting on the Chukchi Sea coast near Point Lay.

Bob Day and **Adrian Gall** (ABR) conducted at-sea surveys of seabirds

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in the northeastern Chukchi Sea during the open water season (late July to mid-October). Our invaluable observers from the bridge were **Lauren Attanas, Jennifer Boisvert, Tim Obritschkewitsch, John Rose, and Peter Sanzenbacher**. This project is a multi-disciplinary oceanographic study that will provide an environmental context for development plans of offshore oil prospects.

Bob Ritchie and **Obritschkewitsch** (ABR) continued their annual aerial survey for breeding Steller's Eiders (*Polysticta stelleri*) in the Barrow region, under contract with USFWS and the North Slope Borough.

Betty Anderson and **Rick Johnson** (ABR) completed the 17th year of aerial surveys for pre-nesting eiders on the Arctic Coastal Plain for ConocoPhillips Alaska, Inc. They enumerated and mapped locations of Spectacled (*Somateria fischeri*), King (*S. spectabilis*), and Steller's Eiders in the oilfields between the Kuparuk River and the northeastern National Petroleum Reserve-Alaska.

Ann Wildman and **Rick Johnson** (ABR) continued their study of breeding Yellow-billed Loons on the Colville River delta and in the National Petroleum Reserve-Alaska. Nesting pairs were monitored with time-lapse cameras at nests to determine nest occupancy and document predator events. After hatch, brood use of lakes was monitored with periodic aerial surveys. Funding for this study was provided by ConocoPhillips Alaska, Inc.

Betty Anderson (ABR) is continuing her long-term study (since 1993) on breeding Spectacled Eiders in the Kuparuk Oilfield for ConocoPhillips Alaska, Inc. In addition to daily road surveys to evaluate numbers and habitat use by pre-nesting eiders in the oilfields, nesting females were monitored for nesting success and incubation constancy with thermistored eggs and time-lapse cameras.

Bob Ritchie, Betty Anderson, and Rick Johnson continued their annual aerial survey for brood-rearing Brant (*Branta bernicla*) and Snow Geese

(*Chen caerulescens*) on the Arctic Coastal Plain. This survey covers the coast between Prudhoe Bay and Barrow and enumerates brood-rearing geese and maps use of coastal salt marshes by geese. Funding is from the North Slope Borough and ConocoPhillips Alaska, Inc.

Pelagic surveys were conducted in the Chukchi and Beaufort Seas under **Kathy Kuletz**; see Bering Sea section, above.

OTHER PROJECTS

Tuula Hollmen (Alaska SeaLife Center and UAF), **Shiway Wang** (Alaska SeaLife Center, Sedna Ecological Inc.), **Sue Budge** (Dalhousie University), and **Matthew Wooller** (UAF) received funding from NPRB to study the diets in threatened eiders using stable carbon isotopes of specific fatty acids, specifically to validate a new technique with controlled feeding experiments. Wang and Hollmen also received funding from the Coastal Marine Resource Grant/National Park Service to validate the use of yolk fatty acids to estimate diets of captive female spectacled eiders.

Hollmen, **David Safine** (Alaska SeaLife Center sea duck research staff), Wang, **Ann Riddle**, and graduate student **Rebekka Federer** (UAF) worked on several projects involving captive eiders, laboratory, and field studies. They focused on reproductive physiology, disease ecology, nutrition, and diving physiology. Federer defended her MSc thesis in April 2009. The title of her thesis is "Quantifying diet to tissue isotopic fractionation factors in captive spectacled eiders: implications for nutrient allocation and foraging studies."

Falk Huettmann and his students at the EWHALE lab (UAF) worked on several offshore and pelagic projects, including Pacific Rim Avian Influenza and science-based policy. Of general interest might also be some of the work on data from higher latitudes (North and South). Specifically, they did some research regarding Marine Protected Areas and the entire protection of the circumpolar arctic, based on the strategic conservation planning tool MARXAN,

using 50 GIS datasets Falk has compiled over the years. Details can be found at the website of the International Polar Year (IPY; search for author's name and "Arctic Protection"): http://www.ipy.org/index.php?option=com_k2&id=1951&category=6&view=item&Itemid=0.

CANADA

Compiled by Ken Morgan

BRITISH COLUMBIA

Doug Bertram's main project involves detection of population trends in Marbled Murrelet (*Brachyramphus marmoratus*) using radar monitoring at key locations in British Columbia (BC). Bertram is based in Environment Canada, Science and Technology Branch (EC/S&T), Sidney, BC. In 2009, **Bernard Schroeder Consulting** (Nanaimo, BC) surveyed the Marbled Murrelet Conservation Regions of Vancouver Island's north and west coasts.

Alan Burger (University of Victoria [UVIC], Victoria, BC) is continuing research on Marbled Murrelets and other seabirds in BC. He is analyzing a database covering 31,000 trees to assess availability of potential nest platforms for murrelets in all coastal regions of the province. **Rob Ronconi** of Dalhousie University (DAL), Halifax, Nova Scotia [NS]) continued his work with Burger on models of factors affecting murrelet nest platforms. Burger is also undertaking a status review of the Marbled Murrelet in Canada for the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In addition, Burger continues to analyze data from past radar and low-level helicopter surveys to identify and map murrelet nesting habitat in BC, working with **Louise Waterhouse** (BC Ministry of Forests, Nanaimo), **Alvin Cober** (BC Ministry of Environment [BCMOE] in the Queen Charlotte Islands [QCI]), and **David (Dov) Lank** (Simon Fraser University [SFU], Burnaby, BC).

Trudy Chatwin (BCMOE, also MSc student at Royal Roads University, Victoria) continued to work on Marbled

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Murrelet habitat recovery and protection with the Marbled Murrelet Habitat Recovery Implementation Group. Chatwin and **Monica Mather** are preparing to publish a model of suitable nesting habitat in coastal BC, based mainly on forest cover characteristics overlain with protected-area data in the province. The result will show how much Marbled Murrelet habitat is protected at a regional and provincial scale. Chatwin and Mather are working with **Jamie Popkin** (Little Earth GIS Consulting, Lantzville, BC) to produce a “MAMU Mashup” for Vancouver Island (<http://mamu.littleearth.ca/>). This database combines habitat, the above model, landscape-scale protected areas, and change in habitat from logging.

Chatwin also reported that BCMOE is working with Island Conservation (IC) to restore former seabird nesting colonies on Lanz and Cox Islands on the northwest coast of Vancouver Island by removing alien mammals. Initial surveys of Lanz, Cox and Triangle islands by IC detected introduced raccoons (*Procyon lotor*) and mink (*Mustela vison*) on Cox Island, mink on Lanz Island and European rabbits (*Oryctolagus cuniculus*) on Triangle Island. **Kirsty Swinnerton** and the IC team plan to focus on removal of mink and raccoons on Lanz and Cox. The IC team includes the Quatsino First Nation. This will be a challenging project, due to the remote and rugged terrain and dense undergrowth of the islands. In her “spare time,” Chatwin completed data collection for her thesis, “Development of Scientifically-based Guidelines for Viewing Seabirds”; she is now analyzing and writing. **Alan Burger** is supervising this work.

In 2009, **Harry Carter** (Carter Biological Consulting, Victoria) and **Trudy Chatwin** conducted colony surveys of Pelagic Cormorants (*Phalacrocorax pelagicus*) in the Strait of Georgia, BC. With **Spencer Sealy** (University of Manitoba [UM], Winnipeg) and others, Carter worked on the distribution and history of murrelets in western North America and eastern Asia.

Jessica Adkins (Oregon State University, Corvallis [OSU]) conducted

aerial surveys of Double-crested Cormorant (*Phalacrocorax auritus*) colonies in BC. She noted that the recent surveys of Pelagic and Double-crested Cormorants suggest shifts in distribution of the species, and general declines or abandonment in many colonies. (However, see BSC’s report, next paragraph.)

Bird Studies Canada (BSC), Delta, BC has been working on a variety of seabird trends. Personnel included **Pete Davidson**, **Rob Butler**, **Dick Cannings**, **Christopher Di Corrado**, and **Karen Barry** (all of BSC), and **Anne Murray** and **Krista Englund** (BC Nature). Preliminary analyses of non-breeding and wintering populations of birds occurring in coastal and near shore habitats in the Georgia Basin, BC, derived from the 10-year Coastal Waterbird Survey data set (www.bsc-eoc.org/volunteer/bccws), revealed stable trends in more than 60% of the approximately 60 species examined. The data showed notable increases in Pigeon Guillemots (*Cephus columba*) and Double-crested and Pelagic Cormorants, but continuing long-term declines in Western Grebes (*Aechmophorus clarkii*) and Black Scoters (*Melanitta nigra*).

Between October 2008 and October 2009, BSC conducted monthly boat-based marine bird and mammal surveys of the Southern Gulf Islands, Boundary Pass and Haro Strait (BC), following a standard protocol. Davidson also reported that the BC Breeding Bird Atlas (www.birdatlas.bc.ca) completed year two of five survey seasons (2008-2014). Seabird colony data included collection and collation of information from other groups (e.g., the Canadian Wildlife Service [CWS] and the Laskeek Bay Conservation Society [LBCS]). Previously unknown colonies of Glaucous-winged Gulls (*Larus glaucescens*) and Double-crested Cormorants in the Strait of Georgia were among the many new discoveries.

BSC continued to coordinate beached-bird surveys in the province, and contributed the data to 2 collaborative papers that were published recently in *Marine Ornithology*.

Tony Gaston (EC/S&T, Ottawa, Ontario), **Akiko Shoji** (MSc student,

University of Ottawa) and **Kyle Elliott** (PhD student, UM) visited Reef Island, QCI during 27 April–11 May to study diving behavior in Ancient Murrelets (*Synthliboramphus antiquus*) and Cassin’s Auklet (*Ptychoramphus aleuticus*), as well as incubation metabolism in Ancient Murrelets. In 2008 only four of 16 birds equipped with time-depth recorders (TDRs) had returned, so this year the researchers increased the sample size of birds returning with TDRs. Using only already-banded birds (which may be more resilient to disturbance than unbanded ones), they retrieved TDRs from 20 birds, leaving only two TDRs unretrieved. One of the TDR-banded birds was 25 years old—which is very old for an Ancient Murrelet!

Gaston also reported that the LBCS field project, led by **Jake Pattison** and **Ainsley Brown**, continued monitoring of seabirds in Laskeek Bay, off the east coast of the QCI. The population of Ancient Murrelets on East Limestone Island has declined steeply in recent years, and the number of chicks trapped in 2009 was the lowest recorded. Predation by raccoons is likely responsible; although raccoons have been eradicated, they can swim to the island and recolonize. Among other species monitored, Cassin’s Auklets appear to be increasing in the islands, and probably also Fork-tailed Storm-Petrels (*Oceanodroma furcata*). Black Oystercatcher (*Haematopus bachmani*) and Glaucous-winged Gull populations appear to be stable in the area.

Anne Harfenist (Harfenist Environmental Consulting, Smithers, BC), along with assistant **Janet Gray** (QCI), continued her study of Leach’s Storm-petrel (*Oceanodroma leucorhoa*) survival at two sites along the British Columbian coast. This is the fourth year of the project, funded through the Bulkley Valley Centre for Natural Resources Research and Management. Adult survival estimates will be generated for two colonies: Rock Islet in southeast QCI and Cleland Island off southwestern Vancouver Island.

Mark Hipfner of the Centre for Wildlife Ecology (CWE), SFU, and

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EC/S&T reported on the 16th year of the CWE's seabird research and monitoring program on Triangle Island, BC. The 2009 field crew consisted of Hipfner and CWE contractors **Kristin Charleton**, **Rachel Darvill**, **Jasmine Freed**, **Glen Keddie**, **Paul Levesque** and **Jason van Rooyen**, volunteer **Michiel Faber**, **Amy-Lee Kouwenberg** (PhD candidate, Memorial University of Newfoundland and Labrador [MUN], St. John's, Newfoundland [NL]), and **Dan Shervill** (Environment Canada [EC]/Canadian Wildlife Service [CWS], Delta, BC). As usual, they monitored breeding chronology and success and related demographic parameters in Cassin's Auklet, Rhinoceros Auklet (*Cerorhinca monocerata*), Tufted Puffin (*Fratercula cirrhata*), Common Murre (*Uria aalge*), Pelagic Cormorant, Black Oystercatcher, and Glaucous-winged Gull. Breeding success in 2009 was generally close to long-term averages for most species. However, no murre raised chicks in 2009—a result of constant harassment by Bald Eagles (*Haliaeetus leucocephalus*) and Glaucous-winged Gulls. EC continued with their seabird monitoring program in BC in 2009, with a reunion of sorts on Triangle Island: **Moira Lemon** (EC/CWS, Delta) led a crew consisting of contractors **Michael Rodway** and **Heidi Reghehr** in population surveys for Cassin's Auklets, Rhinoceros Auklets and Tufted Puffins. Finally, Hipfner, Keddie, Shervill and **David Cunningham** (EC/CWS, Delta, BC) visited the Rhinoceros Auklet colonies at Lucy Island (North Coast), Pine Island (Central Coast), and Sgang Gwaay (QCI) in July and August as part of ongoing genetic and demographic studies on the population-level impacts of fisheries bycatch.

Heather Major continues her PhD at SFU, investigating prospecting decisions and habitat selection by Ancient Murrelets in the QCI and the western Aleutian Islands.

Louise Blight (Centre for Applied Conservation Research, University of British Columbia [UBC], Vancouver, BC) continued her doctoral research on the population dynamics of the

Glaucous-winged Gull, with study sites at Mandarte Island and other colonies in southwestern BC.

Ken Morgan (EC/CWS, Sidney, BC) continued monitoring seabirds in the northeast Pacific and western Arctic. Morgan conducted one survey, and EC contractor **Michael Bentley** conducted two along the 1500-km route referred to as "Line P," from the Strait of Juan de Fuca (BC) to Ocean Station Papa (50°N, 145°W). Bentley also conducted a survey from Victoria across the north Pacific, through the Bering Sea, and east through the Beaufort Sea to Kugluktuk, Nunavut (NU); this marked the third year in a row this route has been monitored.

CENTRAL AND EASTERN CANADA

Tony Diamond (University of New Brunswick [UNB], Fredericton, New Brunswick [NB]) reported that students from UNB continued the long-term research and monitoring of seabirds and their diets on Machias Seal Island, Bay of Fundy, NB. This program, which started in 1995, examines a subpopulation of known-age banded birds in three focal species that represent different foraging and migratory strategies: Atlantic Puffin (*Fratercula arctica*), Razorbill (*Alca tor-da*), and Arctic Tern (*Sterna paradisaea*). Intensive banding and resighting allow the team to track changes in movement and survival. Also, chick growth rates and breeding success are monitored in marked plots or burrows, and diet is monitored by observation and collection of prey items brought to chicks. Other breeding species there include Common Murre, Common Tern (*Sterna hirundo*), Common Eider (*Somateria mollissima*), and Leach's Storm-Petrel. As part of the Gulf of Maine Seabird Working Group, they collaborate closely with US researchers on many islands there, sharing most research and monitoring protocols.

The team has detected substantial changes in the Machias Seal Island colony over the years, the most spectacular being desertion of the colony by both Arctic and Common Terns in 2006 and subsequent years. The data allow

the team to relate this event to changes in both diet and gull predation, the latter due a relaxation of gull control starting in 2000. To put the decline in context, according to CWS records going back to 1873, the tern colony had abandoned the island only once before (in 1944). The colony was the largest tern colony (both species combined) in the Gulf of Maine/Bay of Fundy, and the largest known Arctic Tern colony in North America. It is still the largest colony of Atlantic Puffins, Razorbills, and Common Murres in the Gulf of Maine/Bay of Fundy region. In 2009, herring (*Clupea harengus*) returned to the diet of puffins and razorbills, in proportions not seen since the year 2000. Terns abandoned again, after laying fewer eggs than last year, but in late July they returned in good numbers (about 2000 at one point); the terns displayed, carried fish, selected nest sites, and generally behaved as one would expect if they were about to nest. Many Arctic Terns still carried field-readable bands from the metapopulation study carried out by **Kate Devlin** (see *Auk* 2008, 125:1-9).

Dave Fifield (EC/CWS, St. John's, NL) and **Carina Gjerdrum** (EC/CWS, Dartmouth, NS) continue to coordinate the collection of pelagic seabird data offshore NL and NS. Additional funding was provided by the Environmental Studies Research Fund to map seabird distribution and abundance around hydrocarbon activities in the region. Since September 2008, surveys occurred during 163 days and covered over 10,000 km of ocean track. These surveys are mostly focused on the Grand Banks and Scotian Shelf, but also cover from the Gulf of Maine in the south to Lancaster Sound in the north, and from the central Canadian high arctic in the west to Greenland in the east. The first full-scale analysis of the data will be published this year.

Since June 2009, **Rob Ronconi** has been working as a post-doc with **Marty Leonard** at DAL. Along with colleagues **Sarah Wong** (PhD student, DAL), **Heather Koopman** and **Andrew Westgate** (University of North Carolina, Wilmington), they have been

studying the foraging ecology, habitat selection, and migratory strategies of Greater Shearwaters (*Puffinus gravis*) in the Bay of Fundy. They are doing the work through the Grand Manan Whale and Seabird Research Station on Grand Manan Island, NB. Ronconi and Leonard are also co-supervising honors student **Rolanda Steenweg** (DAL), who is studying season diet shifts in Great Black-backed and Herring Gulls (*Larus marinus* and *L. argentatus*) from Kent Island, NB.

Linda Takahashi (MSc student, MUN) wrote that **Anne Storey** and **Carolyn Walsh** (Cognitive and Behavioural Ecology, MUN) have continued research on the parental care of the Atlantic Puffin and Common Murre in Witless Bay, NL. **Takahashi** recorded behavioral interactions between Common Murre parents while both are at the colony on Gull Island (NL). **Megan Rector** (MUN) completed a supplemental-feeding experiment on Atlantic Puffins for her MSc, using burrow scopes on Gull Island. PhD student **Amy-Lee Kouwenberg** (MUN) collected samples for a stable isotope study using Atlantic Puffins from Gull Island and the Gannet Islands (NL), and Rhinoceros Auklets with **Mark Hipfner** on Triangle Island, BC.

In September 2009, **Rob Ronconi** DALoined **Peter Ryan** (University of Cape Town, Cape Town, South Africa) on a voyage to Inaccessible Island in the mid-South Atlantic. They will be deploying satellite transmitters on Greater Shearwaters (*Puffinus gravis*) to document their northward migration routes. This project is also collaborating with **Marie Caroline-Martin** (PhD student, College of Staten Island, New York).

ARCTIC CANADA

In July, **Tony Gaston** (EC/S&T, Ottawa, ON), along with **Rob Rankin** (MSc, University of Lund, Lund, Sweden) and **Kevin Elner** (volunteer) visited Prince Leopold Island, NU to recapture birds equipped with geolocator tags in 2008. They recaptured 17 tagged Thick-Billed Murres (*Uria lomvia*) and four

tagged Black-legged Kittiwakes. Five murres and two kittiwakes with tags were present but could not be caught. Due to failure of some devices, movement records of only 12 murres and one kittiwake were useable. It was a very early year for breeding at this colony (the earliest on record for both species), probably because the ice broke up very early in the surrounding waters.

Jenn Provencher (UVIC) wrote that a small seabird research team visited Digges Sound (NU) from late July to early August 2009. **Grant Gilchrist** (EC/S&T, Ottawa, ON), **P. Smith** (Carleton University, Ottawa, ON) and Provencher focused effort on the large Thick-billed Murre colony in the area, retrieving geologgers deployed in 2008, completing a photo census of the East Digges Island portion of the colony, and collecting adult murres near Cape Wolstenholme and in Nuvuk Harbour (both in QC). The work was part of an International Polar Year project that has examined changes in adult diet since the early 1980s. The team also conducted surveys at several gull colonies, including pairs of Iceland Gulls (*Larus glaucooides*), Glaucous Gulls (*L. hyperboreus*), Herring Gulls, and Great Black-backed Gulls. Other work included a feeding watch at a small Black Guillemot (*Cephus grille*) colony, a census of small Common Eider colonies, and at-sea surveys that included Atlantic Puffins, Common Loons (*Gavia immer*) and a Razorbill, along with species more common to the area.

OTHER WORK

Ken Morgan is chair of Canada's Pink-footed Shearwater (*Puffinus creatopus*), Short-tailed Albatross (*Phoebastria albatrus*) and Black-footed Albatross (*P. nigripes*) Recovery Team. He contracted **Amy Medve** to write a draft Recovery Action Plan for the three species. In March, **Garry Donaldson** (EC/CWS, Gatineau, Quebec [QC]) and Morgan met with officials from the government of Chile, nongovernmental organizations, academics, and others in Viña del Mar, Chile to discuss a coordinated approach

to the conservation of the Pink-footed Shearwater by Chile and Canada.

Morgan also participated in the Agreement on the Conservation of Albatrosses and Petrels (ACAP) Meeting of the Parties, in Bergen Norway. At the meeting, **Maura Naughton** (U.S. Fish and Wildlife Service [USFWS], Portland, Oregon) summarized status assessments for Short-tailed, Black-footed and Laysan (*P. immutabilis*) albatrosses, written by Naughton, Morgan, and **Greg Balogh** (USFWS, Anchorage, Alaska), with assistance from **Kim Rivera** (National Oceanographic and Atmospheric Administration, Juneau, Alaska). As a result, ACAP member nations unanimously agreed to add the north Pacific albatrosses to the list of species under the Agreement. By the addition of these three species, all species of albatrosses are now under ACAP's umbrella.

Pat O'Hara (EC/CWS, Sidney, BC, and UVIC) is the Pacific lead on the Birds Oiled at Sea (BOAS) program. This program is providing research support for policy, management, and enforcement efforts associated with anthropogenic marine pollution, and for examining impacts that this pollution has on marine ecosystems. The BOAS program in Canada's Pacific region consists of two basic components; the first is marine ecosystem risk assessment of maritime activities in Canadian waters, focusing on illegal intentional and accidental discharges of oily wastes. This component is based on data from the National Aerial Surveillance Program (Transport Canada and EC's Marine Aerial Reconnaissance Team), the Integrated Satellite Tracking of Polluters program (EC), and Marine Communications and Traffic Services of the Canadian Coast Guard. The second component is in monitoring pollution-related change in habitats, communities, and ecosystems. Data informing this component come from several sources: colleagues within EC, the Canadian Department of Fisheries and Oceans, and several beached bird survey programs (BSC, the Coastal Observation and

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Seabird Survey Team, and the Farallones Marine Sanctuary Association).

The Important Bird Areas (IBA) program is undergoing a renaissance in Canada, spearheaded by BC. In partnership with BC Nature, Bird Studies Canada has established caretakers for the province's 84 designated IBAs, has begun revision of the web database, tools and resources (see www.ibacanada.ca), delivered outreach and partnership-building presentations to approximately 20 resource management agencies, and are contributing to the Marine IBA identification process for the Baja to Bering region. And last but not least, BSC has recently made publicly available most major bird monitoring data sets in which they have been involved, through the website www.naturecounts.ca

WASHINGTON-OREGON

Compiled by Don Lyons

MARBLED MURRELETS

The **Marbled Murrelet Effectiveness Monitoring Program**, coordinated by **Gary Falxa** (U.S. Fish and Wildlife Service [USFWS], Arcata, CA) continues to monitor the status and trend of Marbled Murrelet (*Brachyramphus marmoratus*) populations and nesting habitat. This is an interagency effort to evaluate the effectiveness of the Northwest Forest Plan (NWF Plan). We have monitored murrelet populations annually from boats since 2000, covering about 8800 km² of coastal waters, covering murrelet conservation Zones 1 through 5 (from the US–Canada border to San Francisco Bay). Zone 1 (Puget Sound through Straits of Juan de Fuca) surveys were led by **Marty Raphael** and **Tom Bloxton** (U.S. Forest Service-Pacific Northwest Research Station [PNW]). **Scott Pearson** and **Monique Lance** (WDFW) led surveys in Zone 2 (outer coast of Washington [WA]), and Oregon (OR) surveys were led by **Craig Strong**

(Crescent Coastal Research). In California (CA), **Sherri Miller**, with crew leaders **Mark Morrisette** and **Elias Elias** (U.S. Forest Service-Pacific Southwest Research Station [PSW]) led surveys in Zone 4 (Coos Bay, Oregon through Humboldt County, CA). Annual population estimates for the 5-zone area have ranged from 17,400 to 23,700 Marbled Murrelets, with the 2009 estimate at 17,750. The significant declining trend described in 2008 continued in 2009. A summary report with trend analysis and other results is available at their website (<http://www.reo.gov/monitoring/mm-overview.shtml>). Population surveys will continue in 2010.

The Habitat Monitoring Team of the Effectiveness Monitoring Program (including **Marty Raphael**, **Kim Nelson** and **Katie Dugger** of Oregon State University (OSU), **Sherri Miller**, **Jim Baldwin** (PSW), and **Deanna Lynch** and **Rich Young** (USFWS) continue work on modeling murrelet nesting habitat relationships across the 5 conservation zones, for an assessment of murrelet nesting habitat through the first 15 years of the NWF Plan (1993–2008). Other contributors to the monitoring program included **Beth Galleher** (PNW) and **CJ Ralph** and **Linda Long** (PSW), plus the many seasonal technicians who made the population surveys possible. In addition to the NWF Plan, **Martin Raphael** and **Tom Bloxton** surveyed other seabirds and marine mammals in Recovery Zone 1, from the San Juan Islands to Olympia in Puget Sound and the Strait of Juan de Fuca, and continued collecting baseline data on within-season and annual changes in distributions, densities, and productivity indices (as estimated from ratios of juvenile to adult birds) of murrelets in the San Juan Island archipelago—a data set that goes back to 1995.

Turnstone Environmental Consultants conducted Marbled Murrelet surveys for a variety of land managers in 2009. **Tom Williamson** was the Turnstone project manager for Oregon Department of Forestry (ODF) contracts in 7 coastal districts. District representatives for ODF were **Jenny**

Johnson in Astoria, **Nick Stumpf** in Tillamook, **Laurie O’Nion** in Forest Grove, **Ole Buch** in Western Lane, **Ryan Greco** in Coos Bay, **Eric Foucht** and **Dan McMinds** in West Oregon; **Matt Gostin** was the ODF contract administrator. Surveyors conducted more than 1500 surveys at 196 unique sites and 970 unique stations, whose habitat varied among first-, second-, and multi-year forest. Murrelets were detected during 150 surveys and “occupied” behavior was observed during 23 surveys. All surveys were conducted according to PSG’s 2003 survey protocol.

Jeff Reams led murrelet surveys as pre-timber management for Forest Capital Partners (represented by **Jennifer Bakke**) in the coast range of Oregon. Over 50 surveys at 11 unique sites in the Oregon coast range were completed. Reams also supervised 20 surveys at 3 sites in the coast range of Oregon in support of a watershed management plan for the city of Corvallis. **Gary Rodgers** was the City of Corvallis representative. Finally, Turnstone completed the second year of murrelet surveys in support of a proposed energy infrastructure project in northwest Oregon. The project included conducting 74 murrelet surveys at 13 sites located on both public and private lands.

COLUMBIA RIVER: SEABIRDS AND SALMON

Jeannette Zamon (National Oceanographic and Atmospheric Agency [NOAA]-Fisheries), **Elizabeth Phillips** (OSU, Cooperative Institute for Marine Resource Studies), and **Lauren Rein-ald**a (Pacific States Marine Fisheries Commission)—all based at NOAA-Fisheries’ Point Adams Research Station in Hammond, OR—continued research on interactions of Sooty Shearwaters (*Puffinus griseus*) and Common Murres (*Uria aalge*) with juvenile salmonids (*Oncorhynchus* spp.) around the Columbia River plume area. They also collaborated with **Josh Adams** (U.S. Geologic Survey [USGS]), who is using satellite tags to study Sooty Shearwater movements in the California Current

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ecosystem. With excellent assistance from volunteer observers **Ryan Merrill** (WA) and **Terry Hunefeld** (CA), they also completed three at-sea seabird surveys between Cape Flattery, WA and Newport, OR in March, May, and June 2009. Analysis of seabird distribution, oceanographic conditions, juvenile salmon, and forage fish abundance patterns continues, with funding by NOAA and the Bonneville Power Administration. Additionally, Zamon and coworkers continue monthly land-based marine bird and mammal surveys from North Head Lighthouse (Cape Disappointment State Park, WA) to assess year-round wildlife use of the Columbia River plume habitat.

OSU, the USGS-Oregon Cooperative Fish and Wildlife Research Unit, Real Time Research (RTR), and cooperators in the Caspian Tern Working Group continued their research on colony dynamics and seabird predation on salmon smolts in the lower Columbia River and the entire Pacific Northwest. The largest breeding colonies of both Caspian Terns (*Hydroprogne caspia*) and Double-crested Cormorants (*Phalacrocorax auritus*) on the west coast occur on East Sand Island (ESI) in the Columbia River estuary. In 2009, the ESI Caspian Tern colony was approximately 9850 pairs in late May, compared to approximately 10,670 pairs in 2008. Juvenile salmonids comprised 32% of the diet of terns at ESI in 2009, a small increase from 29% in 2008. Northern anchovy (*Engraulis mordax*) and surfperch (Embiotocidae) were the most prevalent non-salmonid prey. After ESI, the Caspian Tern colony at Dungeness Spit, WA has been the second largest in the Pacific Northwest. However, after reaching a peak number of about 500 pairs in early June 2009, the entire Dungeness Spit colony failed by early July due to avian and mammalian predation pressure.

The 2009 Double-crested Cormorant colony at ESI was approximately 12,090 nesting pairs (up from 10,950 pairs in 2008). While colony size fluctuated by 10 to 20% from 2007 to 2009, this colony increased dramatically since first noted

20 years ago. Over 30 Double-crested Cormorants from the ESI colony were tracked in a continuing satellite telemetry study to investigate post-breeding dispersal and location of wintering areas. ESI is also the largest known post-breeding roost site for California Brown Pelicans (*Pelecanus occidentalis californicus*), with over 16,800 Brown Pelicans counted on the island in mid to late July.

On the Mid-Columbia River, near its confluence with the Snake River in eastern WA, the Caspian Tern colony on Crescent Island was estimated at 350 nesting pairs in 2009, down from 390 in 2008. Juvenile salmonids comprised 64% of the diet of Crescent Island terns in 2009, similar to 2000–2007. In 2009, this colony was surpassed by the Goose Island colony in Potholes Reservoir (eastern WA) as the largest colony in the Columbia Plateau Region, with approximately 500 pairs. Goose Island is also the largest Double-crested Cormorant colony in the Columbia Plateau Region, with around 810 pairs nesting in trees at the north end of the reservoir in 2009. Foundation Island, 9 km upriver from Crescent Island, also supports a tree-nesting colony of Double-crested Cormorants, which had at least 310 nesting pairs in 2009.

Implementation of the Caspian Tern Management Plan was continued in 2009 with efforts to relocate terns to artificial nesting islands. Before the 2008 nesting season, the U.S. Army Corps of Engineers (USACE) built two 0.2-ha tern nesting islands at Summer Lake Wildlife Area in southeastern OR, and two 0.4-ha tern nesting islands were built, one each at Crump Lake (southeastern OR) and Fern Ridge Reservoir (near Eugene, OR). Caspian Tern decoys and sound systems playing tern calls were deployed at all sites except Crump Lake. All sites were monitored for tern activity throughout the breeding season. Sixteen pairs of Caspian Terns nested on the new Summer Lake islands in 2009; approximately 420 Caspian Tern pairs nested at Crump Lake, similar to 2008. About 145 fledglings were produced at Crump Lake, where Tui chub (*Gila bicolor*) and catfish

(Ictaluridae) made up the bulk of the diet. As in 2008, no terns nested at the new island in Fern Ridge Reservoir, although video recordings showed multiple visits to the island by different Caspian Terns.

Besides OSU, USGS, and RTR, the Caspian Tern Working Group included representation from NOAA-Fisheries, USACE, USFWS, WDFW, Oregon Department of Fish, Idaho Department of Fish and Game, Columbia River Inter-Tribal Fish Commission, and others. This year's research team included **Dan Roby** (USGS/OSU), **Jessica Adkins**, **Dan Battaglia**, **Maureen Correll**, **Karen Fischer**, **Nathan Hostetter**, **Pete Loschl**, **Don Lyons**, **Tim Marcella**, **Lauren Reinalda**, **Yasuko Suzuki**, **James Tennyson**, and **Coral Wolf** (OSU), **Ken Collis**, **Brad Cramer**, **Allen Evans**, **Mike Hawbecker**, and **John Sheggeby** (RTR), and numerous seasonal technicians and volunteers. Research was funded by the Bonneville Power Administration, USACE, and the Northwest Power and Conservation Council.

WASHINGTON—COLONIES, AT SEA

Scott Pearson, **Peter Hodum** (Oikonos), **Julia Parrish** (University of Washington), and **Tom Good** (NOAA, Northwest Fisheries Science Center) extended their multi-year comparative study of foraging ecology and reproductive success of Rhinoceros Auklets (*Cerorhinca monocerata*) on Protection, Destruction and Tatoosh islands, WA. They also continued their five-year population monitoring program for Tufted Puffins (*Fratercula cirrhata*) on Tatoosh. The comparative foraging study of Rhinoceros Auklets addresses spatial and temporal variation in diet across three different marine habitats. Prey composition differed between sites, with birds on Protection exploiting a narrower range of prey species and depending more heavily on Pacific sand lance (*Ammodytes hexapterus*) than auklets on Destruction and Tatoosh. Despite dietary differences, reproductive performance has been comparable across the three colonies among years. In 2009, Tufted Puffins on Tatoosh had their most

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successful breeding season since monitoring began in 2005.

This past year **Joe Galusha** from Walla Walla University has been studying social facilitation in juvenile Glaucous-winged Gulls (*Larus glaucescens*) on natal territories in the colony on Protection Island National Wildlife Refuge. The young gulls are twice as likely to be doing the same behaviors at the same time with each other as with their parents, neighboring gull chicks, or distant control birds. Doing the same things at the same time may be functionally advantageous to the bonding process in this species. Galusha and colleagues are also analyzing 100 hours of videotape for patterns in preening by adult and juvenile gulls. The length of preening bouts vary greatly (from 0.2 to 13.4 sec) during the series that make up a preen episode (from start to stop of alternating preen and vigilance). Interestingly, the efficiency ratio (length of preen/following period of vigilance) is lower at the beginning and ending of an episode and peaks in the middle.

Lora Leschner, North Puget Sound Wildlife Program Manager, Washington Department of Fish and Wildlife (WDFW), is involved in estuary restoration projects on Padilla, Skagit, and Port Susan Bay as well as the Snohomish River estuary. The WA legislature directed the state to restore habitat for threatened species, but to “restore public lands first” in an effort to reduce impacts on private agricultural land. This has resulted in conflict and controversy, as hunters, bird watchers, and hikers feel that their recreation areas are changed with no replacement for recreation access. However, waterbirds love the newly created estuary habitat and flooded farm fields. It will be exciting to see the habitat changes, and to watch whether the estuary restorations remain productive for water birds. Feasibility studies, including community support for wetland restoration, are planned for 3 of the projects that Lora is managing. Agriculture preservation groups have delayed several projects planned for North Puget Sound by WDFW and Snohomish County.

Joe Evenson, Bryan Murphie, and **Tom Cyra** (WDFW, Puget Sound Assessment and Monitoring Program [PSAMP]) are continuing the low-level aerial bird surveys throughout the inner marine waters of WA this coming winter, as has been done since 1992. Maps of density indices for selected species and other data products are available for the 1992–2008 winters and the 1992–1999 summer surveys at <http://www.wdfw.wa.gov/mapping/psamp/>. These data are also accessible through the Wildlife Resources Data Section, WDFW, Olympia.

WDFW’s mark-recapture study of molting scoters (*Melanitta* spp.) was continued in 2009. As in late summer 2007 and 2008, we used specially modified gill nets to increase banding effort. Over 1600 Surf, White-winged, and Black Scoters (*Melanitta perspicillata*, *M. fusca*, and *M. nigra*) were banded on 26 capture days over a nine-week period at four areas: Padilla Bay, Boundary Bay, the vicinity of Oak Harbor, and the mouth of the Fraser River in British Columbia. Around 3000 scoters have been banded over the study’s three years. This effort has been highly successful due to the extensive collaboration between varied WDFW staff, **Dan Esler, Eric Anderson, Jenn Barrett** (Simon Fraser University, British Columbia), and numerous volunteers from British Columbia and Washington.

WDFW also continued a study on sex and age ratios of scoters and Harlequin Ducks (*Histrionicus histrionicus*) to examine hatch-year recruitment. This work began in February 2008. The sampling scheme involved 40 boat-days of survey covering all winter groups of Harlequin Ducks and a large percentage of wintering scoters known to occur in the inner marine waters of WA. We plan to repeat the effort again in February 2010.

Other projects related to breeding marine birds are continuing or evolving at WDFW. Researchers are banding and fitting VHF transmitters on 20 Black Oystercatchers (*Haematopus bachmani*) to determine wintering flock locations

in northern Puget Sound. They also are archiving the 1999–2003 breeding surveys of Pigeon Guillemots (*Cephus columba*) in the inner marine waters of WA State.

Questions or input on WDFW studies can be directed to **Joe Evenson** (360-790-8691; evensjre@dfw.wa.gov), **Bryan Murphie** (360-790-8687), **Tom Cyra** (425-422-0537), or **Ruth Milner** (360-466-4345x265).

On a sad note for seabird research in WA, for the three remaining staff, and especially for a marine person like himself, budget cuts led WDFW to reassign **Dave Nysewander** from seabird issues to large carnivores. We miss him in the field and try to sneak him out whenever possible.

OREGON—COLONIES, AT SEA

Rob Suryan reported on the Seabird Oceanography Lab (SOL) at OSU’s Hatfield Marine Science Center (HMSC) in Newport. SOL is involved in research on marine and estuarine avian ecology and integrated ecosystem studies, while providing research opportunities for students and developing educational programs. Now in its fourth year, SOL continued to expand the breadth of research projects throughout the north Pacific. Research in 2008–2009 included Common murre (*Uria aalge*) reproductive biology and foraging ecology at Yaquina Head, Oregon; U.S. West Coast fisheries and seabird interactions; life history strategies and environmental forcing (see below for these projects); plus research in Alaska, California, Hawaii, and Japan (details are in reports for those areas).

Suryan, **Amanda Gladics** (USFWS), and **Amanda Stewart** (National Science Foundation intern) conducted studies of Common Murres at the Yaquina Head colony in Newport, OR. This was the third consecutive year of collaborative studies at this site among OSU, USFWS, and the Bureau of Land Management. Reproductive success (fledglings per egg laid) for murres in 2009 was relatively high (77%), similar to 2008, and far greater than 2007 (54%). The most

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striking difference in prey among the past three years was the occurrence of sand lance; this prey was not observed in 2007, became the dominant prey in 2008, and was intermediate in 2009. Bald eagles (*Haliaeetus leucocephalus*) are known to cause significant disturbance to murre colonies in Oregon and were the dominant disturbance source at Yaquina Head during the past three years. Luckily, this colony appears to be large enough to withstand the effects of repeated predation. In fact, the majority of disturbance events have been concentrated on a relatively small area, leaving most of the colony undisturbed during incubation and chick rearing. Asynchrony in egg hatching dates among islets, however, may be caused by the greater predation pressure in some areas, preventing birds from settling on colony and initiating egg laying during early season.

Peter Sanzenbacher and **Brian Cooper** of ABR, Inc. in cooperation with **Shawn Stephensen**, **Roy Lowe**, and **Dave Ledig** (USFWS Oregon Coast National Wildlife Refuge Complex [OCNWR]) developed radar sampling methods to monitor populations of nocturnally active seabird colonies. ABR personnel conducted nocturnal radar and night vision surveys at Leach's Storm-Petrel (*Oceanodroma leucorhoa*) colonies on the southern coast of Oregon during the 2008 and 2009 breeding periods. The goal of these studies is to determine if radar is a viable and effective tool for monitoring nocturnally active species at near-shore colonies. All work was conducted as part of a Challenge Cost Share Agreement between USFWS and ABR. From 29 June to July 8, 2008 a total of 12 radar surveys were done at seven storm-petrel colonies in a week during new moon, from 29 June to July 8. These efforts were spread evenly among seven different storm-petrel colonies. Concurrent with radar sampling, USFWS personnel conducted burrow surveys at a number of colonies to compare methods. During the 2009 season we conducted 20 radar survey nights, five nights per month, from May to August. We saw a wide range of activity levels both within and among colonies. Among factors

affecting colony attendance were weather (particularly high winds), time of night, and seasonal period. Night-vision scans confirmed the identification of radar targets as storm-petrels during nocturnal hours, and also confirmed the presence of mammalian predators, both raccoon and river otter, at the Saddle Rock colony in 2008 and 2009.

Shawn Stephensen, **Amanda Gladics**, **Amy Kocourek**, **Jason Ziegler**, and **Jessica Gelnett** of the OCNWR conducted a census of Leach's Storm-Petrel on nine islands within the Oregon Islands National Wildlife Refuge. A precise population estimate was obtained by determining burrow density, burrow occupancy, and nesting area, calculated with the aid of Light Detecting and Ranging (LIDAR) images. Transects with multiple 1x1-m quadrats were delineated on each island in order to replicate transects over years. The largest Leach's Storm-Petrel colony was at Goat Island with an estimated breeding population of 267,201 individuals. In addition, a reconnaissance botanical survey was conducted on the islands by **Dave** and **Diane Bilderback** (USFWS volunteers). Plant species were collected, dried, and pressed and a comprehensive plant list for each island was obtained. Several rare plants were found and some introduced invasive species were documented.

Stephensen and **Dave Ledig** of the OCNWR conducted an aerial seabird colony survey on June 8–9, 2009 along the entire Oregon coast. The aircraft used was a Bell Jet Ranger III helicopter and total flight time was approximately 10 hours. All cliff-nesting seabird colonies were photographed using digital cameras and birds were counted on the digital images utilizing GIS computer software. Thousands of digital images were organized and archived for future reference. Shawn and USFWS pilot **Ray Bentley** conducted a coastal aerial survey of California Brown Pelicans on September 14–15, 2009. The survey extended from Smith River, Del Norte County, northern CA to Willoughby Rock, Grays Harbor County, southern WA. Total survey flight time was 9.9 hours. We included all rocks, reefs, islands, coastal beaches,

and waters up to 0.5 mile offshore. The aircraft used was a fixed-wing Cessna 182; survey altitude ranged from 200 to 800 feet. A total of 17,926 individual birds were counted in 2009, in comparison to 18,769 in 2007 and 12,425 in 2008. The largest congregation of birds (4,140 individuals) was located on East Sand Island, Columbia River.

Also see "Other Work and News," below, for the OCNWR.

BYCATCH

Shannon Fitzgerald reported on seabird/fishery interaction studies at the Alaska Fisheries Science Center (AFSC), NOAA-Fisheries. In June there was a workshop to improve annual estimates of seabird bycatch in Alaskan commercial groundfish fisheries. Shannon and **Kim Dietrich** completed an analysis examining vessel-specific seabird bycatch features in the demersal longline fleet, and the Freezer Longliner Coalition collaborated on the results. In August the North Pacific Fisheries Foundation and NOAA-Fisheries conducted a pilot program on seabird interactions with paravane (net-monitoring) gear on a trawl vessel. **Jeff Pesta** was deployed for one trip and recorded interaction rates with the gear and worked with vessel personnel to develop mitigation measures. **Ed Melvin**, Washington Sea Grant, and **Kim Dietrich** provided support in the development of field protocols. Groundfish observers continue to retain seabird carcasses during fishing operations for an ongoing seabird necropsy program with **Michelle Hester** and **Hanna Nevins** of Oikonos. Fitzgerald was also the local coordinator for the NOAA-Fisheries National Seabird Program Strategic Planning Workshop, held at AFSC in Seattle in September 2009. The workshop was led by **Kim Rivera**, NOAA's National Seabird Program Coordinator.

Tom Good is continuing collaborative work with the Northwest Straits Commission and Natural Resource Consultants, Inc. on assessing the impacts of derelict fishing gear on marine birds and other species in Puget Sound. Economic stimulus funding through a grant from NOAA will provide resources over the

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next 18 months to find and remove approximately 3000 high-priority derelict nets that remain in Puget Sound. Analyses of nets removed thus far were recently published in *Marine Ornithology* as part of the symposium on the Salish Sea ecosystem that was held at PSG's 2008 Annual Meeting in Blaine, WA.

Ed Melvin and **Troy Guy** of Washington Sea Grant and **Rob Suryan** are continuing to work with NOAA-Fisheries to assess interactions of albatrosses and other seabirds with the hook-and-line and trawl fishing fleets of WA, OR, and CA. To accomplish this they will use at-sea observational and telemetry data from a wide range of seabird studies and PSG collaborators to overlay seabird distributions with fishing effort. They plan to recommend seabird-avoidance measures (in consultation with the fishing industry) and conduct seabird avoidance workshops at ports on the west coast. They also are working with NOAA-Fisheries and USFWS to make streamer lines available free of charge to the west coast fleet.

OTHER WORK AND NEWS

Rob Suryan (OSU) worked with **Morten Frederiksen** (National Environmental Research Institute, Denmark), **Vince Saba** (Virginia Institute of Marine Science), **Bryan Wallace** (Conservation International), **Sarah Wanless** (Centre for Ecology and Hydrology, Edinburgh), and **Scott Hatch** (USGS, Anchorage, Alaska) to synthesize life history parameters for species at multiple trophic levels and different ocean basins, with the goal of showing parallel responses in life history strategies to environmental forcing—climate and both top-down and bottom-up drivers. These results have broad applications for understanding and predicting marine community response to climate change.

Suryan reports that in the field of education, the Seabird Oceanography Lab of OSU's Hatfield Marine Science Center in Newport, OR offered its first short course in marine bird ecology for undergraduates in 2008-2009. The lab also contributed to a weeklong workshop at HMSC for graduate students from many

countries to learn the latest techniques in studying bird migration, organized by MIGRATE (Migration Interest Group: Research Applied Toward Education; <http://www.migrate.ou.edu/>).

Bill loads of prey held by terns and alcids provide valuable data relevant to behavior, ecology, and management of predators and prey. **David P. Craig** (Willamette University) is collecting protocols and reference materials to train field observers in identifying prey, and in estimating prey size with reference to the bill. His goal is to complete a comprehensive manual that will cover all birds of the Pacific Coast that carry bill-loads of fish, including species accounts and images of prey species, for the World Seabird Conference. Contributions and questions are encouraged via his blog site (<http://pacificseabirdbillloads.blogspot.com/>). A more general set of reference photos related to waterbird diet research is at <http://www.flickr.com/groups/565552@N22/>.

Shawn Stephensen (USFWS, OCNWR) successfully defended his Masters thesis at University of Alaska Anchorage (see Alaska report for details).

With great sadness, the OCNWR reports the loss of **David Pitkin** and **Ray Bentley** in a plane crash during aerial waterfowl survey work on the Oregon coast in January 2010. Dave was a remarkably dedicated and inspiring biologist during his tenure at OCNWR from 1992 to 2007, and afterwards continued the work he loved on a variety of waterbird and archaeological projects in the northwest. Dave's legacy of research, superb photography, and warm spirit carries on for those fortunate enough to have known him.

NORTHERN CALIFORNIA

Compiled by Craig Strong

GULF OF THE FARALLONES

PRBO Conservation Science biologists **Russ Bradley** and **Pete Warzybok**, in conjunction with **Gerry McChesney** (U.S. Fish & Wildlife Service [USFWS], San Francisco Bay National Wildlife

Refuge [NWR] Complex) and a host of interns and volunteers continued long-term seabird work at Southeast Farallon Island NWR (SEFI). The seabird research conducted annually at SEFI includes diet, reproductive success, prey availability and distribution, foraging strategy, and oceanographic parameters affecting the 13 species of marine birds that nest there.

There was another year of mixed signals on the Farallones in 2009. Strong upwelling in the early spring likely influenced abundant krill, which were present for most of the season. At-sea surveys conducted by the Gulf of the Farallones National Marine Sanctuary (GFMNS), Cordell Bank National Marine Sanctuary (**Lisa Etherington** and **Kaitlin Graiff**) and PRBO Conservation Science (**Jaime Jahnncke**) indicated high levels of primary and secondary productivity. Krill, krill-eating seabirds (Cassin's Auklets [*Ptychoramphus aleuticus*], storm-petrels (*Oceanodroma* spp.), shearwaters (*Puffinus* spp.), blue whales (*Balaenoptera musculus*), and humpback whales (*Megaptera novaeangliae*) were common to abundant in the Gulf through the fall (October).

With good prey available, Cassin's Auklets on SEFI had high reproductive success and even a few successful double broods, in sharp contrast to recent years of failure. In contrast, a virtual absence of northern anchovy (*Engraulis mordax*) in the diet of piscivorous birds resulted in very poor breeding success of Common Murres (*Uria aalge*), Western Gulls (*Larus occidentalis*), and Brandt's Cormorants (*Phalacrocorax penicillatus*). Murres had their worst breeding year since the 1992 El Nino; Brandt's Cormorants had zero reproductive success, and Western Gulls had their worst breeding year in the Farallon time series. Pelagic Cormorants (*Phalacrocorax pelagicus*) and Pigeon Guillemots (*Cephus columba*) had moderate breeding success, perhaps linked to juvenile rockfish (*Sebastes* spp.) stocks close to the island. California Gulls (*Larus californicus*) attempted to breed on SEFI for the second straight year, again failing to fledge any young. Notable events from 2009 also

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included the first successful Peregrine Falcon (*Falco peregrinus*) nesting on SEFI in over 60 years and a pair of resident ravens (*Corvus corax*) regularly excavating Cassin's Auklet burrows.

The Beach Watch program of GFNMS, led by **Jan Roletto**, **Shannon Lyday**, **ru Devlin**, and **Jamie Hall** detected an unusually large number of dead Brandt's Cormorants along the outer coast beaches in mid-March. The mortality event, from Bodega Head in Sonoma County south to Año Nuevo Island in San Mateo County, continued throughout the spring. Lesser mortality occurred in Western Grebes (*Aechmophorus occidentalis*), Double-crested Cormorants (*Phalacrocorax auritus*), Common Murres, and loons (*Gavia* sp.). Mortality of seabirds subsided during the summer, while numbers of dead California Sea Lions (*Zalophus californianus*) increased greatly and peaked in August. The numbers of dead cormorants and sea lions were 6 to 8 times higher than average for the spring and summer months, in comparison to data for the previous 16 years. Cause of death in most animals was due to starvation (emaciation). It is suggested that the main cause of mortality was upwelling anomalies and a mismatch with the timing of anchovy production in the Gulf of the Farallones. There may have been larger-scale processes over the winter of 2008–2009 to cause anchovies to move farther north. By most accounts, seabird and pinniped mortality was less both north and south of the region.

OTHER COLONIES

Ron LeValley (Mad River Biologists) led a group of about ten volunteers, sponsored by the Mendocino Audubon Society and the Bureau of Land Management, to monitor three cormorant colonies in central Mendocino County. They visited the colonies 3–5 times a week and photographed the colonies once a week. They monitored 60 nests out of about 400 in one Brandt's Cormorant colony on the Mendocino Headlands, and 18–20 nests in each of two Pelagic Cormorant colonies.

The Sea Ranch Task Force, headed by **Rich Kuehn** and **Diane Hichwa** and sponsored in part by the Madrone Audubon Society and the Bureau of Land Management, finished their third year of intensive monitoring of a Brandt's Cormorant colony at Gualala Point Island, Sonoma county. Work included regular aerial photos of the island and of the nearby colony at Fish Rocks in southern Mendocino County. Nesting success is still being analyzed, but all colonies, including those monitored by LeValley in Mendocino, had their best reproduction in years. Most nests fledged multiple chicks and, in two instances, Pelagic Cormorants laid a second clutch after fledging young (neither second clutch was successful).

Susan Euing (USFWS) and **Meredith Elliott** (PRBO Conservation Science) monitored the Least Tern (*Sternula antillarum browni*) colony at Alameda Point (the former Naval Air Station, Alameda). The colony had another successful reproductive year during 2009. There were an estimated 318 breeding pairs and a total of 346 nests. Of the 669 eggs laid, 538 of them hatched, giving an 80% hatching success rate. An estimated 356 fledglings were produced, and breeding success was 1.2 fledglings per breeding pair. Few eggs were abandoned or failed to hatch, but predation on adults and fledglings was high, and crows were responsible for taking abandoned and failed-to-hatch eggs at the end of the season.

A project on colony status and diet of Caspian Terns in San Francisco Bay was in its second year in 2009. The team included **Dan Roby** (U.S. Geologic Survey [USGS]/Oregon State University [OSU]), **Lindsay Adrean**, **Dan Battaglia**, **Don Lyons**, **Allison Patterson** and **Yasuko Suzuki** (OSU), **Ken Collis** and **Allen Evans** (Real Time Research) and a number of seasonal technicians and volunteers. They found Caspian Terns at 6 colonies in 2009, with a total of approximately 830 breeding pairs, compared to approximately 1025 breeding pairs at 4 sites in 2008. Brooks Island in the north bay (nearest the Sacramento

Delta) held approximately 82% of the population. The diet of Brooks Island terns was dominated by surfperch (*Embiotocidae*), silversides (*Atherinidae*), and anchovies (*Engraulis mordax*), with juvenile salmonids making up about 9% of the diet, similar to 2008. Telemetry data on 50 adult Caspian Terns radio tagged at Brooks Island showed that most commonly used foraging areas were outside of San Francisco Bay in the nearshore area, and in the north bay from the east side of San Pablo Bay up to the mouth of Carquinez Strait. Other colonies were located at Eden Landing, Stevens Creek, Agua Vista Park, Ravenswood Park, and Redwood Shores. Prey composition at Eden Landing differed from Brooks Island, with silversides and flatfish (Pleuronectidae and Bothidae) dominating; juvenile salmonids made up less than 1% of the diet.

This study was funded by the U.S. Army Corps of Engineers, with logistic support and technical assistance from the East Bay Regional Parks, USFWS/Don Edwards NWR, California Department of Fish and Game (CDFG), and San Francisco Bay Bird Observatory.

Mark Rauzon (Marine Endeavors; now at Laney College, Geography Department) surveyed the Double-crested Cormorants on San Francisco Bay bridges in May, along with **Meredith Elliott** (PRBO Conservation Science). Numbers of breeding cormorants were the lowest since record keeping began in 1999, which appears attributable in part to a food shortage experienced by all central California cormorants in 2009. In addition, a new colony of Caspian terns (*Hydroprogne caspia*) was located in Marin County.

Kris Robison of the University of California, Davis (UCD) reports on continued monitoring of Western and Clark's grebes (*Aechmophorus occidentalis* and *A. clarkii*, respectively) in northern California. The project is a joint effort between California's Office of Oil Spill Prevention and Response (OSPR), the *Kure-Stuyvesant* Trustee Council, and the California Institute of Environmental Studies. Field work

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was accomplished by Robison, **Dan Anderson**, and **Renée Weems** (UCD), and **Frank Gress** (California Institute of Environmental Studies). Aerial surveys, population and productivity transects, disturbance monitoring, and outreach activities were the main objectives at several important breeding sites: Clear Lake (Lake County), Eagle Lake (Lassen County), Lake Almanor (Plumas County), and Tule Lake NWR (Siskiyou County). Compared to the last two years, 2009 showed an increase in number of nests and number of young produced at all sites, however, nest numbers and productivity at Clear Lake and Eagle Lake are still well below historical levels. Two likely reasons for recent low nesting efforts are prolonged drought, which has limited the available nesting substrate, and chronic human disturbance (especially at Clear Lake).

MARBLED MURRELETS

Sal Cinnichi reports that the Humboldt Redwood Company, LLC (HRC) is a new company formed last year as a result of the Pacific Lumber Company's bankruptcy. HRC is continuing conservation activities for the Marbled Murrelet (*Brachyramphus marmoratus*) under its company Habitat Conservation Plan (HCP). Murrelet occupancy and numbers are tracked over years using both radar and audio-visual survey techniques at the Headwaters Forest Reserve (HFR), the Humboldt Redwoods State Park (HRSP), and Marbled Murrelet Conservation Areas (MMCAs) on HRC forest lands. Collaborators are Mad River Biologists and O'Brien Biological Consulting. Audio-visual surveys resulted in detections of occupancy by murrelets at HFR, HRSP, and the majority of the MMCAs. In addition, the HCP's marbled murrelet research fund continued to support the research of **Zach Peery** (University of California, Berkeley) and collaborators on murrelet ecology and genetics.

Steve Singer continues his long-term audio-visual monitoring of Marbled Murrelets with the assistance of **Portia Halbert** at Gazos Creek Canyon in the

Santa Cruz Mountains, central California. Steve and **Tom Hamer** (Hamer Environmental) used radar surveys at several sites surveyed by radar 8–10 years ago (results are pending). Steve also remains active in evaluation of forest nesting habitat and acquisition of property for NGOs in the Santa Cruz Mountains.

The Marbled Murrelet Effectiveness Monitoring Program, coordinated by **Gary Falxa** (USFWS, Arcata, California) continues to monitor the status and trends of Marbled Murrelet populations and nesting habitat from northern California to the Canadian border. Further details are in the Washington-Oregon Regional Report (above).

OIL SPILL RESTORATION PROJECTS

Laird Henkel (OSPR) reports on restoration projects for seabirds in northern California that have been funded by oil spill settlements in recent years. Multi-agency trustee councils select and oversee all restoration projects. Two trustee councils are currently funding seabird-related projects in northern California, with others in planning stages or nearing conclusion. Projects are summarized here; details for some are elsewhere in this regional report.

The *Kure/Stuyvesant* Trustee Council (for two spills in Humboldt Bay) began implementation in 2008. Projects include (1) reduction of disturbance to nesting Common Murres at Redding Rock (Bureau of Land Management and USFWS), (2) a study to determine appropriate methods to reduce disturbance to roosting pelicans and cormorants (Humboldt State University), (3) reduction of disturbance at Western/Clark's Grebes nesting colonies (UCD), (4) corvid management to enhance nesting success of Marbled Murrelets (Redwood National Park), and (5) habitat acquisition for Marbled Murrelets (Save the Redwoods League).

The *Command* Trustee Council (for a spill in the San Francisco Bay area) began implementation in 2004. Current projects include (1) reduction of disturbance through outreach and

monitoring by the Seabird Protection Network (GFNMS), (2) enhancement of nesting habitat for Common Murres on SEFI (USFWS and PRBO Conservation Science), (3) enhancement and protection of nesting habitat for Rhinoceros Auklets (*Cerorhinca monocerata*) at Año Nuevo Island (Oikonos, California State Parks), (4) removal of non-native rats from nesting colonies of Sooty Shearwaters (*Puffinus griseus*) in New Zealand (Oikonos), (5) acquisition of habitat for Marbled Murrelets (Save the Redwoods League), and (6) corvid management in the Santa Cruz Mountains (California State Parks). All projects include monitoring of success.

The *Luckenbach* Trustee Council (for spills from a historic sunken wreck in the Gulf of the Farallones) will implement several seabird restoration projects as funds are made available from the National Pollution Funds Center. Planning is underway for restoration projects to compensate for seabird losses during the *Cosco Busan* oil spill in San Francisco Bay in November 2007. The *Apex Houston* and *Cape Mohican* Trustee Councils (both for spills in the San Francisco Bay area) have mostly completed their restoration projects. To view restoration plans and for other information, see www.dfg.ca.gov/ospr/spill/nrda/nrda.html

COLONY RESTORATION

The Common Murre Restoration Project completed its 14th year of seabird restoration and monitoring in central California, with funds from the *Command* and *Apex Houston* Trustee Councils. Gerry McChesney (USFWS), **Rick Golightly** (Humboldt State University [HSU]), **Harry Carter** (Carter Biological Consulting [CBC]), **Steve Kress** (National Audubon Society), and **Karen Reyna** (GFNMS) were contributing leads. Field personnel included **Lisa Eigner**, **Sandy Rhoades**, **Peter Kappes**, **Mary Davis**, **Jonathan Shore**, **Crystal Bechaver**, and **Phil Capitolo**. They tracked disturbance, attendance patterns, and breeding performance at several murre colonies between Point Reyes and

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Point Sur in 2009. Murres had extremely low productivity at all monitored colonies. For the first year since restoration efforts began in 1996, no murre chicks survived to departure at Devil's Slide Rock. Brandt's Cormorants bred in very low numbers and also suffered very low productivity, concomitant with a large starvation event in spring. Disturbance from aircraft and boats continues to be high at Devil's Slide Rock. Special Closure zones were recently declared there and at five other central California colonies under California's Marine Life Protection Act, which should help reduce boat disturbance in the future.

In conjunction with the restoration project, annual aerial photographic surveys of northern and central California colonies of murres, Brandt's and Double-crested Cormorants were conducted in 2009 by **Phil Capitolo** (University of California, Santa Cruz) and **Laird Henkel** (OSPR).

In 2009, Gerry McChesney, Rick Golightly and **Dawn Goley** (HSU) initiated a feasibility study for Common Murre restoration at Redding Rock off the northern California coast, with assistance from Harry Carter (CBC). Support was from the *Kure-Stuyvesant* Trustee Council. Field personnel included **Janet Thibault**, **Allison Fuller**, and **Mallory Mlynarek**. This study is examining the causes of murre decline on the rock, including disturbance from humans and sea lions, and potential options for restoration.

OTHER WORK

Elizabeth Phillips (OSU, Cooperative Institute for Marine Resource Studies), **Jim Harvey** and **Hannah Nevins** (Moss Landing Marine Laboratories), together with **Josh Adams** (USGS) and **Dave Jessup** (CDFG). Marine Wildlife Veterinary Care and Research Center began a project to compare hematological values and other health parameters of Northern Fulmars (*Fulmarus glacialis*) in Monterey Bay with birds admitted to

rehabilitation facilities during die-off or oiling events. This project is a follow-up study to the 2007 Santa Cruz Mystery Spill event, and is funded by the Oiled Wildlife Care Network. Their goal is to obtain baseline information on blood reference ranges and body condition indices for this abundant Procellariid, which will help improve rehabilitation protocols.

A cooperative study is examining how climate change affects the timing of seasonal production cycles and food-web dynamics. The group includes the Farallon Institute for Advanced Ecosystem Research (**Bill Sydeman**, **Jarrold Santora**), **Rob Suryan** of the Seabird Oceanography Lab at Oregon State University's Hatfield Marine Science Center, NOAA-Fisheries Pacific Fisheries Environmental Lab, the Bodega Marine Lab of the University of California, Davis, and the Ocean Modeling Group at the University of California, Berkeley.

Sarah Allen (Point Reyes National Seashore [PRNS]) reports that the California Fish and Game Commission, with authority from the Marine Life Protection Act, established several marine reserves in the north central California region. These included a few special closure areas for seabirds in Point Reyes National Seashore. The primary seabird exclusion areas include a 1000-ft boat exclusion zone around most of Point Reyes Headland and a 300-ft zone around Miller Rocks and Stormy Stack in Drakes Bay. Whether these buffer zones are effective in reducing disturbance from boats will be monitored in coming years by the USFWS and PRNS.

SOUTHERN CALIFORNIA

Compiled by **Dan Robinette**

COLONIES

Kathy Keane (Keane Biological Consulting [KBC]) and assistants monitored the nesting population of the California Least Tern (*Sternula antillarum browni*) in Los Angeles Harbor.

Least Terns initiated 435 nests in 2009, an 18% decrease from 2008 numbers. The reduction may be due to reduced prey availability, frequent visits by a Peregrine Falcon (*Falco peregrinus*), and unsuccessful vegetation management. As well as Least Terns, about 4500 Elegant Terns (*Sterna elegans*) and 250 Caspian Terns (*Hydroprogne caspia*) nested successfully within the harbor in 2009. KBC also monitored a restoration project in Upper Newport Bay, Orange County, to ensure that dredging and other activities avoid nesting Least Terns and other endangered birds. KBC also completed a white paper summarizing 20 bird surveys over a one-year period in the Los Angeles and Long Beach harbors; Western Gull (*Larus occidentalis*), Brandt's Cormorant (*Phalacrocorax penicillatus*) and Surf Scoters (*Melanitta perspicillata*) were the most numerous species. Finally, KBC compiled a database for the U.S. Fish and Wildlife Service (USFWS) Portland office of all nesting tern species and the Black Skimmer (*Rhynchops niger*) in California.

Dan Robinette and **Julie Howar** (PRBO Conservation Science) have completed their 11th year collecting seabird data at Vandenberg Air Force Base. Breeding success in 2009 was similar to 2008, with pelagic feeding seabirds having the highest success, followed by demersal feeders then rocky intertidal feeders. The California Least Tern population doubled in 2009 but continues to be undersized compared to pre-2004 numbers. Least Tern fledging success was the 2nd highest on record, with 1.23 fledglings per pair. Brandt's and Pelagic (*Phalacrocorax pelagicus*) cormorant productivity was above average, while that for Black Oystercatchers (*Haematopus bachmani*) was below average. The Western Gull colony at North Rocky Point suffered major disturbance and nest losses due an influx of California sea lions (*Zalophus californianus*), which remained at the point all season and reached record numbers. We also documented sea lions pupping on North Rocky Point, which is not common.

In the Channel Islands National Park, the Montrose Settlements Restoration Program (MSRP) implemented several seabird restoration projects and continued four seabird habitat restoration projects. Participants included **Harry Carter** (Carter Biological Consulting, Victoria, British Columbia), **Bill McIver** (USFWS, Arcata), **Gerry McChesney** (USFWS, Newark), **Laurie Harvey** (National Park Service), and **Darrell Whitworth** and **Frank Gress** (California Institute of Environmental Studies [CIES]). Reproductive effort, success, and phenology of Cassin's Auklets (*Ptychoramphus aleuticus*) were monitored on Scorpion Rock (Santa Cruz Island), as well as at a reference site at Prince Island (San Miguel Island). Extensive revegetation and soil stabilization were completed on Scorpion Rock in fall 2009; plant work was carried out in cooperation with Growing Solutions. Reproductive effort, success, and phenology of Ashy Storm-Petrels (*Oceanodroma homochroa*) were monitored on Orizaba Rock and in 4 sea caves at Santa Cruz Island. The team also carried out social attraction and artificial nest site projects for colony restoration, and tracked reproductive effort, success, and phenology of Xantus's Murrelets (*Synthliboramphus hypoleucus*) and Cassin's Auklets at Santa Barbara Island (SBI). Plant habitat restoration was expanded to four sites on SBI, and social attraction for Cassin's Auklets was initiated there. Harry, Laurie, Frank and Darrell also studied Xantus's and Craveri's (*S. craveri*) Murrelets on islands of at western Baja California with colleagues **Eduardo Palacios** (CIES), **Tim Birt**, and **Vicki Friesen** (Queen's University, Kingston, Ontario, Canada), among others.

Pat Mock (URS Corporation) is assisting the San Diego Regional Airport Authority in their long-range planning for the management of the California Least Tern colony present on airport property.

In retirement, **Charlie Collins** continues his field studies of California Least Terns breeding at Seal Beach Naval

Weapons Station and also "harvesting" survival data (i.e. reading bands) for Black Skimmers and Caspian Terns in Southern California. He is also working up a variety of accumulated data (not all on seabirds) for publication.

AT SEA

Patricia Baird (Simon Fraser University [SFU], British Columbia), conducted a foraging study on California Least Terns within San Diego Bay, and from the nearshore area to 30 km offshore from the bay. Baird's grad student, **Tyler Willsey** (SFU), an assistant from the University of British Columbia (**Melody Kirkby**), and one from California State University Fullerton (**Greg McMichael**) rounded out the research crew. They determined where the birds foraged throughout the breeding season, adult and chick diet, and age class of the fish species taken.

Lisa T. Ballance and **Robert L. Pitman** continue to conduct seabird surveys for the National Marine Fisheries Service (NOAA)-Fisheries, Southwest Fisheries Science Center [SWFSC]). Their work is part of the SWFSC's marine mammal and ecosystem assessment cruises. Two areas are monitored regularly: (1) The California Current (the US Pacific coast between borders with Mexico and Canada, and seaward 300 nautical miles) is surveyed every three years during June–November for 120 sea days aboard one NOAA research vessel. The most recent survey was completed in December 2008. This project includes collaboration with national marine sanctuaries along the west coast, with fine-scale assessment conducted in sanctuary waters during some surveys. More details are at <http://swfsc.noaa.gov/prd-orcawale.aspx> (2) The Eastern Tropical Pacific (waters between the US-Mexico border, Hawaii, and Peru) is surveyed approximately every three years during August–November, using 240 sea days aboard two NOAA research vessels. The most recent survey was conducted in 2006; the next survey is planned for 2010. Details can be found at <http://swfsc.noaa.gov/prd-star.aspx>

NON-PACIFIC U.S.

Compiled by **Melanie Steinkamp**

Lisa Ferguson Eggert (Clemson University [CU]) continued her PhD research focusing on reproductive and physiological ecology of seabirds at protected colonies in South Carolina, under guidance of **Patrick Jodice** (CU, and U.S. Geologic Survey [USGS], South Carolina Cooperative Research Unit). **Gillian Brooks** (CU) initiated her MS degree examining nesting success of Black Skimmers (*Rhynchops niger*) and Least Terns (*Sterna antillarum*) in the Cape Romain National Wildlife Refuge. Work on movement patterns of Audubon's Shearwaters (*Puffinus lherminieri*) and White-tailed Tropicbirds (*Phaethon lepturus*) nesting in the Bahamas continues under Co-principal investigators **Will Mackin** and **Jennifer Arnold** (CU). Two devices were retrieved from shearwaters after 5 weeks in 2008, 4 were retrieved from shearwaters after 1 year, and 3 from tropicbirds after 1 year. Plans are to continue deploying and attempting to retrieve geolocators in 2010.

In 2009, **Sara Williams** and staff of U.S. Fish and Wildlife Service (USFWS) Maine Coastal Islands National Wildlife Refuge (MCINWR) completed the second of a 3-year Adaptive Management Study on tern habitat for 3 islands in the Gulf of Maine. The study was designed to enhance Arctic and Common Tern (*Sterna paradisaea* and *S. hirundo*) nesting habitat. They considered options such as active predator control and annual management such as mowing, prescribed fire, or sheep grazing to cost-effectively create vegetation communities that will stay low during the tern breeding season. This study will aid in selecting appropriate islands for future seabird restoration, and in management of multiple islands.

Sarah Spencer, in cooperation with **Linda Welch** of MCINWR and **Paul Sievert** of the USGS Massachusetts Cooperative Fish and Wildlife Research Unit, continues her thesis work on foraging ecology of Atlantic Puffins

(*Fratercula arctica*) on Petit Manan Island in the Gulf of Maine. Sarah is also developing a predictive model for identifying sex of breeding puffins in the Gulf of Maine using morphometrics, investigating burrow characteristics of alcids nesting on Petit Manan Island, and modeling foraging habitat using temperature-depth recorders and oceanographic conditions.

Katie Kauffman (Organismic and Evolutionary Biology, University of Massachusetts, Amherst) continued her thesis research on foraging and diving behavior, chick diet, and reproductive success of Razorbills (*Alca torda*) on Matinicus Rock, Knox County, Maine, part of the MCINWR. Her collaborators were **Paul Sievert**, **Linda Welch**, and **Scott Hall** of the Audubon Seabird Restoration Program (SRP). In 2009, Kauffman collected diving data from breeding adults using time-depth recorders, and she estimated chick growth rate at the colony.

A highlight of the 2009 season for the SRP included the first Common Murre (*Uria aalge*) egg on Matinicus Rock, Knox County, Maine in more than 100 years. The egg was found by SRP staff in late June next to 150 murre decoys; unfortunately it failed and was likely predated by gulls. Another highlight was the discovery of a near-fledging Manx Shearwater (*Puffinus puffinus*) on Matinicus Rock in one of 6 burrows checked by Hall and USFWS refuge staff on 8 Sep. This is the first confirmed fledging of a Manx Shearwater chick in the United States, and only the third North American nesting record. Though 2009 was unusually wet and cold at MCINWR, there appeared to be ample Atlantic Herring (*Clupea harengus*) prey for seabirds. Nesting of terns (4 species) was normal to slightly below recent average numbers on the seven islands managed by SRP, except that the Roseate Tern (*Sterna dougallii*), which is listed under the federal Endangered Species Act, continued to decline (34%

since 2001). In contrast, Atlantic Puffin and Razorbill burrow numbers were at a record high, beating the 2008 figures. With funding assistance from the Maine Sea Grant program, SRP fitted band-mounted LOTEK LAT2500 geolocators on eight Atlantic Puffins from Seal Island to learn about winter distribution.

Jeff Spendelow (USGS-Patuxent Wildlife Research Center [PWRC]) continues to oversee a long-term cooperative research project on the metapopulation dynamics and ecology of endangered Roseate Terns in the Massachusetts-Connecticut-New York region. Spendelow, **Carolyn Mostello** (Massachusetts Division of Fisheries and Wildlife) and her staff trapped 724 terns at Buzzards Bay Islands (BBMA). Old band combinations were recorded and fixed as needed, and 411 new color band combinations were placed. By the end of 2009, over half of the breeding adults in BBMA were color-banded. During postbreeding dispersal of the terns, Spendelow worked with staff of Massachusetts Audubon's Coastal Waterbird Program, including **Becky Harris** (Director), **Ellen Jedrey** (Assistant Director), and others, and with **Edie Ray** (Nantucket Conservation Foundation) and others to resight and identify banded Roseate Terns all around the greater Cape Cod-Islands area. From 20 Jul to 20 Sep, Spendelow identified 1165 color-banded individuals. These represented over half the 2100 color-banded Roseate Terns that were estimated to be alive since the resumption of colorbanding in 2004. Of particular interest, nearly all fledgling Roseates that were color-banded at Country Island, Nova Scotia, Canada were resighted in Massachusetts. This suggests that the entire northwest Atlantic breeding population stages in Massachusetts prior to fall migration to South America. When the 2009 resighting work is complete, it should result in nearly 12,000 identifiable "bird-day" sightings from at least 10 locations.

HAWAI'I AND PACIFIC

Compiled by Linda Elliot

HAWAI'I

The Tagging Of Pacific Pelagics program (TOPP) continues to study albatrosses at Tern Island, French Frigate Shoals, and the Northwest Hawaiian Islands. Researchers on the program include **Bill Henry**, **Melinda Connors**, **Dan Costa** (University of California, Santa Cruz [UCSC]), **Maura Naughton** and **John Klavitter** (U.S. Fish and Wildlife Service [USFWS]), **Marc Romano** (National Oceanographic and Atmospheric Administration [NOAA]-Fisheries), **Rob Suryan**, (Oregon State University [OSU], Seabird Oceanography Lab), **Lindsay Young** (Pacific Rim Conservation), and **Scott Shaffer** (San Jose State University). Work includes tracking birds with satellite transmitters and GPS archival data loggers during the incubation and chick-brooding periods, with the focus on interannual variability in foraging behavior (Kappes et al, in press.) and eventually on longer-term changes. The data series now runs since 2002.

The data-logger studies have expanded in scope and collaboration. In addition to tracking birds at Tern Island, we have deployed archival tags on Laysan and Black-footed Albatrosses (*Phoebastria immutabilis* and *P. nigripes*) at Midway, O'ahu (Kaena Point), and Guadalupe Islands; Laysan Island will be added in 2010. These long-term data sets will allow us to map the albatrosses' population-level usage of the North Pacific with greater resolution. We have collected one season's worth of data so far, and the tags are back out again. Rob Suryan and the team used these data to note that many tagged birds were visiting areas in the Gulf of Alaska, and spent surprisingly long periods of time there. We also collected data on albatross feather molt during at-sea captures in these regions. Using these two data sets, we began to investigate the hypothesis that albatrosses may go to specific areas to molt during the non-breeding season.

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If this is true, it would have implications for at-sea conservation of albatrosses, and would provide critical information for establishing marine important bird areas and marine protected areas.

In addition to Tern Island albatrosses, the TOPP team has also started tracking Red-footed and Masked Boobies (*Sula sula* and *S. dactylatra*) using GPS data loggers. The boobies provide a marked contrast with albatross foraging behavior, because they stay relatively close to the atoll.

There have been a few personnel changes in TOPP. Doctoral student **Melinda Connors** (co-advised by Scott Shaffer and Dan Costa) is now leading Tern Island work, since we happily report that **Michelle Kappes** completed her doctoral thesis in June 2009. Michelle is enjoying the warm weather of Reunion Island (In the Indian Ocean near the Seychelles) as a postdoctoral scholar with Matthieu Le Corre at Université de la Réunion. Scott Shaffer has also relocated to a tenured faculty position at San Jose State University (new contact scott.shaffer@sjsu.edu). He's not far from UCSC, though. Please contact Scott for further details or questions on TOPP.

In addition to the TOPP work, Rob Suryan, Lindsay Young, Scott Shaffer, and **David Hyrenbach** (Hawaii Pacific University [HPU]) are studying breeding biology, diet, and at-sea distribution of four seabird species on Lehua Island, Hawaii. **Wendy Johnson** (Hawaii Wildlife Center) wrote about Freeman Seabird Preserve (FSP), a 2.5-ha site at Black Point, O'ahu, which supports a small colony of Wedge-tailed Shearwaters (*Puffinus pacificus*). David Hyrenbach compiled data from the second annual count of active nests at FSP, which was conducted at the beginning of September by Hawaii Audubon, USFWS, HPU students, and neighbors at Black Point. Numbers were up 22% from 64 (6 Sep 2008) to 78 (89 Sep 2009). Nest monitoring revealed 70% hatching success with a median date of 12 Aug. Three eggs showed evidence of rodent predation. Predator control at the site consists of six Diphacinone stations, which are

monitored twice monthly and replenished as needed. While the birds were at sea (December through March), Hawaii Audubon Society volunteers met at FSP on a regular basis to remove trash and invasive vegetation. Long-term goals for habitat restoration include reintroduction of native plants and creation of additional burrow and nesting sites.

Nick Holmes (Kaua'i Endangered Seabird Recovery Project) and **David Leonard** (Hawaii Division of Forestry and Wildlife (HDFW)) reported on their research on Newell's Shearwater (*Puffinus auricularis newelli*) and Hawaiian Petrel (*Pterodroma sandwichensis*) on Kauai. Radar surveys replicating earlier surveys by **Robert Day** of ABR, Inc. indicated a continuing decline of Newell's Shearwater, which is corroborated by the recovery rates of grounded fledglings over 20 years. Additional radar surveys were used to test the statistical power of trend data. Along with night vision and acoustic surveys, radar was also used to locate and characterize all colonies of the above species, as well as Band-rumped Storm-Petrels (*Oceanodroma castro*). Holmes and Leonard also studied Barn Owl (*Tyto alba*) distribution and abundance near petrel colonies. They worked with HDFW, USFWS, the Nature Conservancy, and others to develop means of controlling introduced predators, minimize impact of ungulate fence construction near colonies, and study flight behavior at ball fields and other areas that are lit at night. Contact David at david.l.leonard@hawaii.gov for complete reporting.

Jay Penniman, **Fern Duvall II**, Wildlife Biologists, and **David Leonard** (HDFW) continued studies on biology and distribution of Hawaiian Petrels and carried out initial predator control measures at Lanaihale, Hawaii under Lanaihale Endangered Seabird Management. Auditory surveys, supplemented with night vision and thermal imaging methods, revealed abundant petrels at all accessible areas in approximately 14 km² of steep ridge habitat that is dominated by native uluhe fern (*Dicranopteris linearis* and *Diplopterigium bipinnatum*).

Because human access to nesting habitat can damage the uhule and burrows, we will use aerial vegetation mapping to map remaining habitat and invasive species. Only four chicks fledged out of 11 active burrows among 15 burrow sites monitored. Barn owls, feral cats (*Felis sylvestris*), and rats (*Rattus* spp.) were proven predators on Hawaiian petrels. We made over 21,000 trap sets with 68 box traps through the season using various baits, and captured 9 cats. Rat trapping prior to use of diphacinone revealed Black or roof rats (*R. rattus*) to be common, with Polynesian (*R. exulans*) and Norway (*R. norvegicus*) rats also present. The USFWS is fencing 4,000 acres of Lanaihale, and additional predator control and ungulate removal will take place once the fence is finished.

PACIFIC

Scott Shaffer (San Jose State University) and **Hillary Young** (Stanford University) are studying trophic interactions and foraging ecology of seabirds on Palmyra Atoll, as part of Hillary's doctoral thesis.

Mark Rauzon (Marine Endeavors, now at Laney College, Geography Department) surveyed birds in American Memorial National Park, Saipan (Northern Mariana Islands), in July 2009. Mark located nesting Little Terns (*Sterna albirostris*), new for the park list. Photos may be seen at www.rauon.zenfolio.com.

LATIN AMERICA Compiled by Linda Elliot

The Peruvian non-governmental organizations APECO and ProDelphinus are collaborating with the American Bird Conservancy (ABC) on seabird bycatch in longline and gillnet fisheries. Pro-Delphinus is also working to reduce the intentional capture of Waved Albatrosses for human consumption. In addition, ABC worked with **Samuel Amoros** to reduce the threat that traffic poses to the endangered Peruvian Tern (*Sterna*

lorata) breeding colony in Paracas National Reserve. ABC has also supported **Dr. Carlos Zavalaga** in Paracas in assessing threats to the Peruvian Diving-Petrel (*Pelecanoides garnotii*), including satellite tracking of this species.

In 2009, the American Bird Conservancy (ABC) expanded its efforts to reduce seabird bycatch in eastern Pacific fisheries. ABC is working with the Ecuadorian and Peruvian governments, the Agreement on the Conservation of Albatrosses and Petrels (ACAP), and many other partners to further the National Plans of Action for Seabird Conservation in Ecuador and Peru. ABC and Ecuadorian partner Equilibrio Azul began the largest independent observer program on the artisanal fishery in Ecuador, and the first one to collect data on the critically endangered Waved Albatross (*Phoebastria irrorata*). The program was initiated because of informal reports from fishermen that albatross bycatch was relatively common. The Waved Albatross nests in the Galapagos Island, and we know from satellite tracking data that its foraging routes take it to southern Peru, but its behavior in Ecuadorian waters was unknown. It was suspected that they passed through relatively quickly, but observer data show that they follow fishing boats, and that large groups are frequently present and squabble over offal and baited hooks. This work is the first year of a three-year program to reduce accidental bycatch of seabirds.

In Chile, ABC, Oikonus, and the Juan Fernandez Island Conservancy are working with the Chilean Government to improve conservation of the Pink-footed Shearwater (*Puffinus creatopus*) at its largest breeding colony on Isla Mocha. Historically, human consumption has posed a serious threat to the colony there. In the first field season (winter 2009/10), **Dr. Erin Hagan** will lead an international team of biologists to map and monitor the breeding burrows on the island, and will affix satellite tags to document their migration north to Canadian waters. Funding for this project includes generous support from the U.S. National Fish and Wildlife Foundation.

In Mexico, ABC is working with **Bill Henry** (UC Santa Cruz) to assess seabird bycatch in the artisanal fishing fleets of northern Baja California.

ASIA

Compiled by Linda Elliot

In South Korea, the 3rd International Symposium on Migratory birds was held on 25 September 2009, hosted by National Park Research Institute and Shinan County. The topic of this symposium was "Seabirds in Danger: Invasive Species and Conservation of Island Ecosystems." **Kyung-Gyu Lee** (a PSG member from Shinan County) presented his work on conservation of Swinhoe's Storm Petrels (*Oceanodroma monorhis*) breeding on 4 islands (Chilbaldo, Sokuguldo, Kuguldo and Gaerindo). About 110,000 individuals of Swinhoe's Storm-Petrels (90% of world population) breed between late June and mid July in South Korea. Although breeding islands are protected by Cultural Heritage Administration of Korea, he and his team described effects of introduced plants on breeding. The petrels rarely build their nests in area with introduced plants such as *Miscanthus sinensis*, *Artemisia princeps* and *Achyranthes japonica*. These plants are accidentally introduced by human and goats in islands. The most serious problem is *Achyranthes japonica*, which has sticky seeds that can trap petrels when they visit their chicks in the burrows. In 2008 and 2009, more than 80 individuals died due to *Achyranthes japonica*. Mr Lee and his colleagues are investigating whether removing invasive plants will help the breeding success of Swinhoe's Storm Petrels.

Also during the symposium, **Dr. Young-Soo Kwon**, PSG member and researcher in the National Park Institute, talked about seabird conservation in South Korea, particularly concerning the globally-threatened Saunders' Gull (*Larus saundersi*). About 7100 to 9600 Saunders' Gulls are found in

South Korea. For the past few years, the gulls have bred in an area reclaimed for development of a new town. Now they have to leave the reclaimed area because development is proceeding. Dr. Kwon stressed that we need to make a plan for Saunders' Gulls. Last August, **Miran Kim** (PSG member, Research Fellow in Hanyang University) helped Mr Lee and his team to remove invasive plants in Chilbaldo. She is interested in conservation and the egg color variation in gulls. In May 2009, she took digital images of Black-tailed Gull (*Larus crassirostris*) eggs in Hong-do, South Korea and will look at the factors affecting eggshell color variations.

In Japan, a collaborative study is continuing on the endangered Short-tailed Albatross (*Phoebastria albatrus*). Participants include the Yamashina Institute for Ornithology (**Kiyoaki Ozaki, Fumio Sato, Noboru Nakamura**), the Japanese Ministry of Environment, (**Naoki Amako**), the USFWS (**Greg Balogh, Judy Jacobs**), University of Massachusetts (**Paul Sievert**), and the Seabird Oceanography Lab at Oregon State University (**Rob Suryan**.) Satellite-tracking efforts, now in the seventh year, are revealing the at-sea distribution and marine habitat use of breeding season adults and post-breeding fledglings. Transmitters are being placed on birds in the colony on Torishima Island. Another aspect of Short-tailed Albatross studies is the experimental translocation of chicks to recolonize a historical breeding site, Mukojima in the Bonin Islands (Ogasawara). A component of this project is satellite tracking of chicks after fledging, to ensure that survival and migration of translocated and hand-reared chicks are similar to those of naturally reared individuals. These juvenile birds will be tracked into US waters to evaluate potential fishery interactions. Evaluation of threats from bycatch is particularly important, because a small sample during previous studies suggested that hatch-year birds appear to have very different movement and distribution patterns than sub-adults and adults, which causes them to overlap a larger variety of fisheries.

INFORMATION FOR CONTRIBUTORS TO *PACIFIC SEABIRDS*

Pacific Seabirds is a journal of the Pacific Seabird Group. Manuscripts and news items are welcome on any topic relating to Pacific seabirds or to their conservation. Short manuscripts are preferred (about 1,000 to 5,000 words for major submissions). Submit materials to the Editor (except as noted below): Dr. V.M. Mendenhall, 4600 Rabbit Creek Road, Anchorage, Alaska 99516; e-mail fasgadair@attalascom.net. Deadlines are normally 15 April for the spring issue and 15 October for the fall issue.

CONTRIBUTIONS

Contributors are invited to submit the following:

- **Articles** on original research (to be peer-reviewed)
- **Reports** on current topics (e.g., research in progress or seabird conservation issues; not peer-reviewed)
- **Forum** (discussion of a current topic)
- **Review articles** (these may cover seabirds worldwide)
- **Conservation News** (*submit to* Craig Harrison, Conservation Chair; e-mail charrison@hunton.com)
- **News items** (short news relating to seabird research, conservation, or the Pacific Seabird Group)
- **Book reviews**
- **Letters** commenting on content of *Pacific Seabirds* or other issues
- **Art work**, such as sketches or photos of seabirds, either accompanying a text or for publication alone

PEER-REVIEW OF MANUSCRIPTS

Articles and review articles will be submitted to two peer reviewers for technical review. Other submissions may also be sent for review, if the author requests this or at the editor's discretion.

SUBMISSION OF MANUSCRIPTS

Material may be submitted by e-mail or regular mail or (addresses above). Materials sent by e-mail should be attached to the main message and should be in Word, WordPerfect, or

Rich Text Format, except that materials less than 300 words long may be sent in the body of the e-mail. For manuscripts submitted by e-mail, figures must also be sent as separate files or via regular mail. If a manuscript is submitted by regular mail, include a CD.

FORMAT OF MANUSCRIPTS

Contributors should consult format in a recent issue of *Pacific Seabirds*. Back issues are online at www.pacific-seabirds.org

GENERAL FORMAT

Manuscripts should be double-spaced with 1-inch margins. If your paper size is A4 (European), **the bottom margin must be at least 1¾ inch** (including in electronic files), to ensure that it will print properly on U.S. equipment. Pages should be numbered, except for Tables and Figures.

Give the scientific name (*italicized*) after the first mention of any genus or species. English names of bird species are capitalized (e.g., Fork-tailed Storm-Petrel). Names of mammals, other taxa, and English names of bird groups are lowercase, except for proper names (e.g., blackbirds, shield fern, Steller's sea cow).

If you use an acronym, give the entity's *full* name the first time it is mentioned. Avoid excessive use of acronyms.

Use the 24-hour clock without a colon (e.g., 1830). Give dates as day-month-year. Use metric measures, except

when quoting informal statements. For quantities less than 1, use an initial 0 ($P = 0.95$, not $P = .95$).

Typographical conventions follow *Scientific Style and Format*, 6th edition, by the Style Manual Committee of the Council of Biology Editors; Cambridge University Press (1999).

ORGANIZATION

Articles should contain the following sections, in this order: Title, Author(s), Authors' affiliations (including e-mail for corresponding author), Abstract, Key words, Introduction, Methods, Results, Discussion, Acknowledgments, Literature Cited, Tables, Figure legends, and Figures. **Other types of manuscript** may use a different organization (e.g., a review or report could contain sections on various locations); however, the same formats for Literature Cited, Tables, and Figures will apply.

Abstract—An abstract is required for longer articles and suggested for short ones. It should contain essential information from each section of the text, without statistics. One or more additional abstract(s) may be provided in languages other than English.

Key words—Five to 10 words for use in computerized searching. Species names in both Latin and English should be included.

Introduction—Present the aims and significance of the work, and place it in the context of pre-existing information. State hypotheses that are being tested, if any.

INFORMATION FOR CONTRIBUTORS

Methods—Describe the methods, location, time, and personnel of the study. Include statistical methods, if any.

Results—Present results that are pertinent to aims given in the Introduction. Where feasible, summarize information and give the full data in Tables or Figures. Give sample sizes and the significance levels of statistical tests. Literature citations normally should not be in the Results section.

Discussion—Summarize the results briefly, then evaluate the results, and develop their importance in relation to other work. Do not include primary results and statistical tests, which belong in Results.

Text citations should be “Surname year.” Two authors are “Surname and surname year”; 3 or more authors are “Surname et al. year” (but all authors should be given in the Literature Cited). E.g., (Pratt et al. 1987, Schreiber and Schreiber 1988). If appropriate, specify page number(s) in a book or long article (Pratt et al. 1987:32-34).

Literature Cited—List all references in alphabetical order of the authors’ surnames. Surname of the first author should be listed first, then initials; subsequent authors’ names should be listed as Initial(s), Surname. List all authors in the Literature Cited (do not use “et al.”). Year of publication follows, then title and journal reference. Include page numbers for all cited works, including the total number of pages in a book. Use standard abbreviations for journal titles; if you are unsure, spell them out. Spell out names of agencies and institutions.

The first line of each citation should be justified to the left margin; subsequent lines may be left-justified or indented.

Do not use all-capital letters or italics in the Literature Cited, except that scientific names should be in italics. Examples:

Pratt, H.D., P.L. Bruner, and D.G. Berrett. 1987. A field guide to the birds of Hawaii and the tropical Pacific. Princeton University Press, Princeton, NJ. 409 pp.

Schreiber, E.A., and R.W. Schreiber. 1988. Great Frigatebird size dimorphism on two Central Pacific atolls. *Condor* 90:90-99.

Verify that all items in the Literature Cited are referenced in the article, and vice versa.

For articles that you have read in a language other than English, list the citation in the original language. An English translation of the title [in brackets] is optional.

SUPPORTING MATERIALS

Tables—Tables should be numbered in the order they are first mentioned in the text. Refer to each table at least once. Use horizontal lines below the main heading(s); do not use vertical lines in tables. The Table (including its heading) should be comprehensible without immediate reference to the text. Data in Tables should not be repeated in the text, except to summarize.

Figures—Figures should be numbered in the order they are first mentioned in the text. Refer to each figure at least once. Figures should be drawn at least 50% larger than they will appear in print. Make all lettering, numbers, and symbols large enough to be read easily after they are reduced. The figure (including caption) should be comprehensible without immediate reference to the text. Define all symbols in a legend or the caption. Shading in figures should be black,

white, or coarse cross-hatching; *do not use half-tone shading or background*.

For each figure, a high-quality graphics file or original drawing must be submitted with the final version of the manuscript. Graphics files should be in TIFF (preferably), GIS, or EPS format, separate from the text document. A high-resolution JPG file may work; graphics in Word format are not acceptable.

Photographs—*Pacific Seabirds* occasionally publishes photos. The best ones are very sharp, with good detail and a range of dark/light values. Digital images submitted by e-mail must be at least 250 ppi (when reduced to publication size). The common low-resolution snapshot (often 72 ppi) does not reproduce well in publication; most cameras give the option of higher resolution. *Do not submit half-tone originals*. If the original is in color, submit it in that format; the editor will convert it to black and white.

Art work—Original art work is welcomed. The original or a high-resolution scan should be sent.

REVISIONS AND PROOFS

Materials that are sent for peer review will be returned to the author, along with reviewers’ and editorial suggestions. If the Editor has accepted the article, he or she will endeavor to return the manuscript within 60 days. If the article needs major work, the author may be invited to revise and re-submit it for future acceptance.

For peer-reviewed articles, proofs will be mailed to the author before publication. Corrections should be returned within one week. Proofs of other materials will not be sent to the author unless he or she requests them.

PUBLICATIONS OF THE PACIFIC SEABIRD GROUP

The Pacific Seabird Group publishes symposia and other works. **PSG Symposia** are occasionally held at Annual Meetings; those which have been published are listed below. **Technical Reports** prepared by PSG working groups also are listed. *To order one of these PSG publications, please see instructions after each item.*

Abstracts of papers and posters given at PSG meetings are published annually. Abstracts for meetings of 1974 through 1993 appeared in the PSG Bulletin (Volumes 2–20); for meetings of 1994 through 2003, in Pacific Seabirds (Volumes 21–30); and for meetings of 1997 and later, at www.pacificseabirdgroup.org

PSG publishes the journals *Pacific Seabirds* (www.pacificseabirdgroup.org) and *Marine Ornithology* (www.marineornithology.org). Current and past issues of both journals are available online or by subscription. Back issues may be obtained online; those of Pacific Seabirds also are available from the PSG Treasurer (order form on last page).

SYMPOsia

SHOREBIRDS IN MARINE ENVIRONMENTS. Frank A. Pitelka (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Asilomar, California, January 1977. Published June 1979 in Studies in Avian Biology, Number 2. *Available free of charge at* <http://elibrary.unm.edu/sora/Condor/cooper/sab.php>

TROPICAL SEABIRD BIOLOGY. Ralph W. Schreiber (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Honolulu, Hawaii, December 1982. Published February 1984 in Studies in Avian Biology, Number 8. *Available free of charge at* <http://elibrary.unm.edu/sora/Condor/cooper/sab.php>

MARINE BIRDS: THEIR FEEDING ECOLOGY AND COMMERCIAL FISHERIES RELATIONSHIPS. David N. Nettleship, Gerald A. Sanger, and Paul F. Springer (Editors). Proceedings of an International Symposium of the Pacific Seabird Group, Seattle, Washington, January 1982. Published 1984 as Canadian Wildlife Service, Special Publication. *Out of print; available free of charge at* www.pacificseabirdgroup.org

THE USE OF NATURAL VS. MAN-MODIFIED WETLANDS BY SHOREBIRDS AND WATERBIRDS. R. Michael Erwin, Malcolm C. Coulter, and Howard L. Cogswell (Editors). Proceedings of an International Symposium at the first joint meeting of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Colonial Waterbirds 9(2), 1986. \$12.00. **Order from:** Ornithological Societies of North America, PO Box 1897, Lawrence, Kansas 66044; phone (800) 627-0629; no online orders.

ECOLOGY AND BEHAVIOR OF GULLS. Judith L. Hand, William E. Southern, and Kees Vermeer (Editors). Proceedings of an International Symposium of the Colonial Waterbird Society and the Pacific Seabird Group, San Francisco, California, December 1985. Published June 1987 in Studies in Avian Biology, Number 10. \$18.50. *Available free of charge at* <http://elibrary.unm.edu/sora/Condor/cooper/sab.php>

AUKS AT SEA. Spencer G. Sealy (Editor). Proceedings of an International Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published December 1990 in Studies in Avian Biology, Number 14. *Available free of charge at* <http://elibrary.unm.edu/sora/Condor/cooper/sab.php>

STATUS AND CONSERVATION OF THE MARBLED MURRELET IN NORTH AMERICA. Harry C. Carter, and Michael L. Morrison (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Pacific Grove, California, December 1987. Published October 1992 in Proceedings of the Western Foundation of Vertebrate Zoology, Volume 5, Number 1. \$20.00. **Order from PSG Treasurer** (order form on last page), *or available free of charge at* www.pacificseabirdgroup.org

THE STATUS, ECOLOGY, AND CONSERVATION OF MARINE BIRDS OF THE NORTH PACIFIC. Kees Vermeer, Kenneth T. Briggs, Ken H. Morgan, and Douglas Siegel-Causey (editors). Proceedings of a Symposium of the Pacific Seabird

PSG PUBLICATIONS

Group, Canadian Wildlife Service, and the British Columbia Ministry of Environment, Lands and Parks, Victoria, British Columbia, February 1990. Published 1993 as a Canadian Wildlife Service Special Publication, Catalog Number CW66-124-1993E. **Order free of charge from:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A 0H3, Canada.

BIOLOGY OF MARBLED MURRELETS—INLAND AND AT SEA. S. Kim Nelson and Spencer G. Sealy (Editors). Proceedings of a Symposium of the Pacific Seabird Group, Seattle, Washington, February 1993. Published 1995 in *Northwestern Naturalist*, Volume 76, Number 1. \$12.00. **Order from PSG Treasurer** (order form on last page), **or available free of charge at** www.pacificseabirdgroup.org

BEHAVIOUR AND ECOLOGY OF THE SEA DUCKS. Ian Goudie, Margaret R. Petersen and Gregory J. Robertson (editors). Proceedings of the Pacific Seabird Group Symposium, Victoria, British Columbia, 8-12 November 1995. A special publication compiled by the Canadian Wildlife Service for the Pacific Seabird Group. Published 1999 as Canadian Wildlife Service Occasional Paper number 100, catalog number CW69-1/100E. **Order free of charge from:** Publications Division, Canadian Wildlife Service, Ottawa, Ontario, K1A 0H3, Canada, **or available free of charge at** www.pacificseabirdgroup.org

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TECHNICAL PUBLICATIONS

EXXON VALDEZ OIL SPILL SEABIRD RESTORATION WORKSHOP. Kenneth I. Warheit, Craig S. Harrison, and George J. Divoky (editors). Exxon Valdez Restoration Project Final Report, Restoration Project 95038. PSG Technical Publication Number 1. 1997. **Available free of charge at** www.pacificseabirdgroup.org

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